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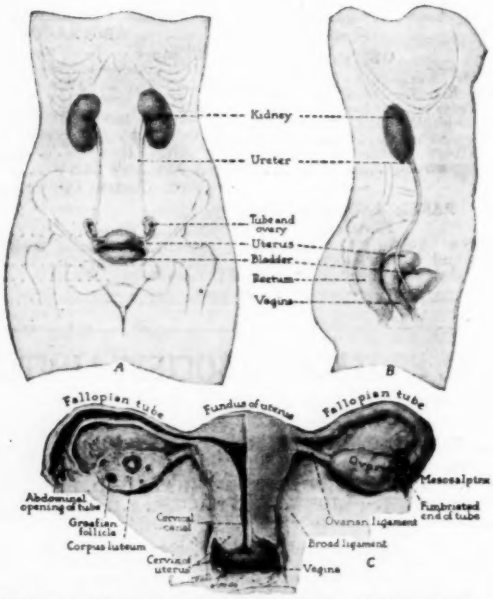

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ADDRESSES AND ORIGINAL ARTICLES

THE CONDITIONS OF FŒTAL RESPIRATION *

BY J. BARCROFT, C.B.E., D.Sc., F.R.S.
PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF CAMBRIDGE

BY way of preface some explanation of my interest in the conditions which govern fœtal respiration may be desirable.

In the course of studies by P. Rothschild (1932), W. Herkel, R. A. Hill (1933), and myself the following fact emerged—to wit, that as pregnancy proceeded in the rabbit the blood leaving the uterus and returning to the mother become increasingly dark. This indeed followed from two other observations made at the same time: (1) by the twentieth day of pregnancy the placenta and the volume of blood in the fœtal vessels had attained to about half their ultimate measure; (2) at the same date the embryos were scarcely of more than negligible size (Fig. 1). From this time onward the demand for oxygen made by the fœtuses grew quite disproportionately to the supply, with the result that the hæmoglobin of the maternal venous blood became increasingly denuded of that gas and the blood in the uterine veins became darker as the days passed.

The fœtus then grows in an environment the oxygen concentration of which is falling all the time—an uphill business you may say. True indeed, for is it not the problem of Everest, the maintenance of the organism in an atmosphere becoming progressively rarer? In one case the oxygen is in the air, in the other it is dissolved in the plasma of the blood which feeds the embryo, but substantially the problem is the same. Is the solution of the problem similar as well? Acclimatisation on the mountain consists of factors which depend upon the modifications in the actual process of pulmonary respiration and in those which affect the composition of the blood. The former can have no place in the life of the embryo. It is not without interest whilst studying embryonic respiration to keep one eye upon the mountain climber, in the economy of whose blood two principal changes have been noted—an increase in the hæmoglobin present, and a shift in the oxygen dissociation curve in the sense of greater affinity of the blood for oxygen (see Anselmino and Hoffmann, 1931).

A study of the chemical aspect of the problem might have been regarded as redundant in view of the anatomical findings of Mossman in rabbits. This author described the fœtal and maternal vessels as being, over part of their course, parallel and so disposed that the blood entering from the fœtus was in juxtaposition with that leaving the placenta in the maternal vessels, whilst the blood leaving for the fœtal circulation was in juxtaposition with the entering maternal arterial blood; thus along the whole length of its course the fœtal blood could pick up oxygen from that of the mother and leave the placenta of almost normal arterial quality. Nevertheless, so far as is known, this efficient anatomical arrangement is not of very general occurrence, and it seemed therefore interesting to carry out some experiments along chemical lines.

* The substance of an address given at the meeting of the American Association of Science in Chicago, on June 20th, 1933. The paper is a résumé of work carried out by G. S. Adair, J. Barcroft, S. Dickinson, R. H. E. Elliott, R. E. Havard, W. Herkel, F. G. Hall, A. StG. Huggett, A. B. Keys, E. F. McCarthy, F. J. W. Roughton, and M. Talaat, which will shortly be published in extenso.

AN INVESTIGATION AND ITS RESULTS

Previous workers in this field had been Huggett (1927), and also Haselhorst and Stromberger (1930, 1931), both of whom had worked by modern methods. The latter workers had performed an elegant research on human subjects who had been objects of Cæsarean section; Huggett worked on goats.

Both the above authors made observations on the oxygen dissociation curve and their results differed, for while Huggett described the curve of the fœtal

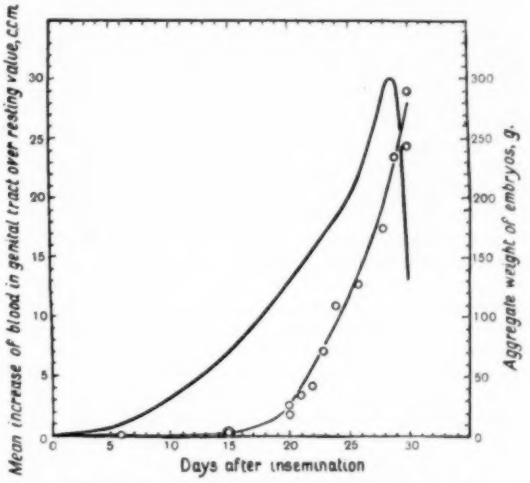

FIG. 1.—Showing increase in the volume of blood in the genital tract of the rabbit during pregnancy (left hand curve) and the aggregate weight of the embryos (right hand curve).

blood as being to the right of the maternal, Haselhorst and Stromberger placed the curves in the reverse positions.

There is no research which purports systematically to have followed the possible alterations throughout the whole course of pregnancy. Huggett's goats were operated on as near to full term as possible, whilst the experiments of the German workers took place, in the nature of the case, at the birth of the infants.

A detailed description of the technical methods which we employed would here be out of place. Suffice it to say that we were able to obtain a series of goats, all "stocked" about the same time. The period of gestation in the goat is 21 weeks; we commenced our observations at the end of the seventh week, when the fœtus weighs about 10 g., and operated on one goat weekly, the weight of the kid at birth being somewhat over 2000 g. Of the series two proved not to be pregnant. A third, unfortunately the last, was found to have congestion of the lungs; while therefore it might have formed the starting point of a very interesting research on the effect of acute pulmonary trouble in the mother on fœtal circulation and respiration, it could yield no results of value as a final experiment on our series of normals. Between the seventh and the eighteenth week however we have a tolerable series.

The dissociation curve of the mother may be considered first. The curves of control goats which had not been stocked within 21 weeks of the date of investigation are not quite identical but fall within a very restricted area. This is true whether the blood be "whipped" or whether it be diluted with a measured quantity

of oxalate-fluoride mixture—the oxalate to prevent clotting, the fluoride to prevent glycolysis. Anæsthetised non-pregnant goats yield curves also within this area, though if urethane is used the curves tend to be at the right hand edge.

The dissociation curves of the goats of our stocked series which were not pregnant fell also within this area. They were operated on in every way like the pregnant animals, their condition being revealed on opening the uterus. Of the pregnant goats, that investigated in the seventh week also yielded a dissociation curve within the normal area, but from the tenth week onwards the curve commenced to drift to the right of the normal area, that is in the sense that the oxygen became more and more easily detachable from the hæmoglobin (Fig. 2). By the eighteenth week the 50 per cent. saturation point of the maternal curve had moved some 9 mm. to the right of the mean normal position.

Note here that the degree of inflection of the curve is unaltered; any one of the maternal curves might be derived from any other by a mere alteration of the scale on which the horizontal component is drawn.

The dissociation curve of the fœtal blood.—Ninth and tenth week embryos were the youngest on which we experimented. On the blood of each we made a single determination. Here again the curve seemed to fall within the normal area. The determinations made on the weeks just subsequent at first gave the impression that just as the maternal curve drifted to the right, the fœtal curve drifted to the left—a symmetrical process taking place (Fig. 3). That impression was not altogether borne out by the facts—as appeared when we were able to obtain a larger number of points on any particular curve. At all events it is only a partial representation of them. It is true that in the fifteenth week the 50 per cent. saturation point of the fœtal blood is to the left of that in the tenth or eleventh week; but a new point appeared. The fœtal dissociation curve was at this stage of a different essential shape from that of the mother. It was less inflected; at about 90 mm. the two cross, and from this point downwards they diverge. The proportionate distance between them expressed as a function of the distance of one or other from the ordinate, increases progressively as the saturation diminishes. Actually between 80 per cent.

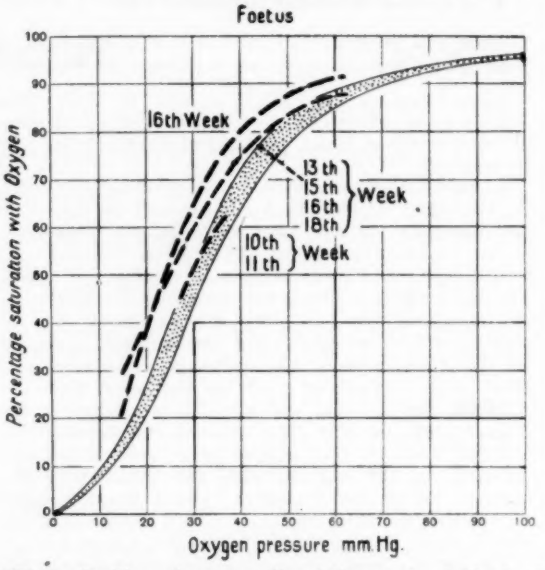

FIG. 3.—Position of oxygen dissociation curve of blood of embryos during the course of pregnancy. 50 mm. CO_2 pressure.

and 40 per cent. saturation the fœtal and maternal curves are roughly parallel, separated in the fourteenth week by about 13 mm.

At a later stage the gap is greater, the dissociation curve of the mother having shifted further to the right, whilst that of the fœtal blood remains in much the same place as in the fourteenth week, but towards the end of pregnancy the degree of inflection seems to vary within wider limits approximating in some cases to that of the maternal blood (Fig. 4).

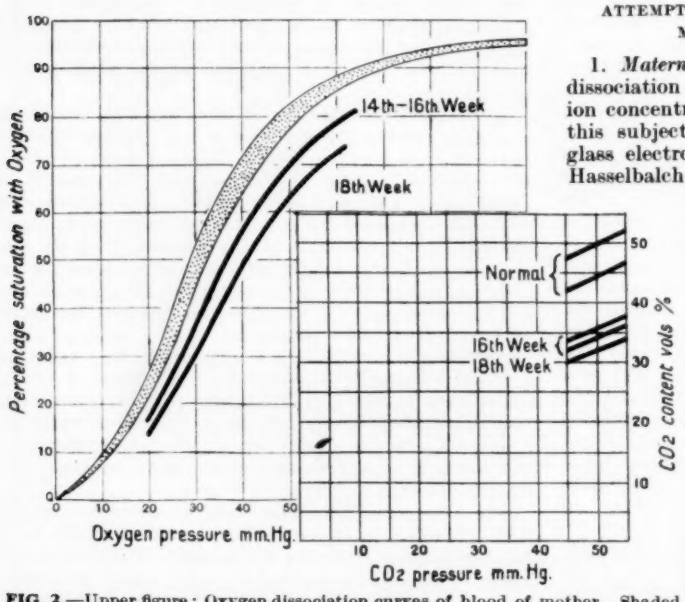

FIG. 2.—Upper figure: Oxygen dissociation curves of blood of mother. Shaded area includes normals, anæsthetised normals, and pregnant goats up to the seven weeks of pregnancy. 50 mm. CO_2 pressure. Lower figure: CO_2 dissociation curves showing fall in alkali reserve.

ATTEMPT TO EXPLAIN THE MOVEMENT OF THE MATERNAL AND FŒTAL CURVES

1. *Maternal.*—The alteration in the position of the dissociation curve appears to be a matter of hydrogen-ion concentration. Experiments have been made on this subject by Havard and Dickinson, using the glass electrode, and also by Hall and Keys by the Hasselbalch-Henderson method. In the former case the pH of the blood as taken from the vessels was measured; the answer therefore depended largely on the momentary concentration of CO_2. The plotting of the CO_2 dissociation curves allows of a comparison under standard conditions. This comparison indicates that the blood of the mother loses in base as the pregnancy proceeds, for there is a progressive drop in the alkali reserve of the plasma (Fig. 2).

2. *Fœtal.*—Alterations in the hydrogen-ion concentration cannot be said to account for the peculiar features of the blood in the fœtal circulation. There is no evidence that the alkali reserve of the fœtal blood is higher than that from the normal goats, or that it rises as pregnancy proceeds. Indeed, the evidence so far as it goes is: (1) that the alkali reserve of the

fœtal plasma is on the whole intermediate between that of normal goats' plasma and that of a goat in the later stages of pregnancy; (2) that it is maintained at a fairly constant level; (3) from

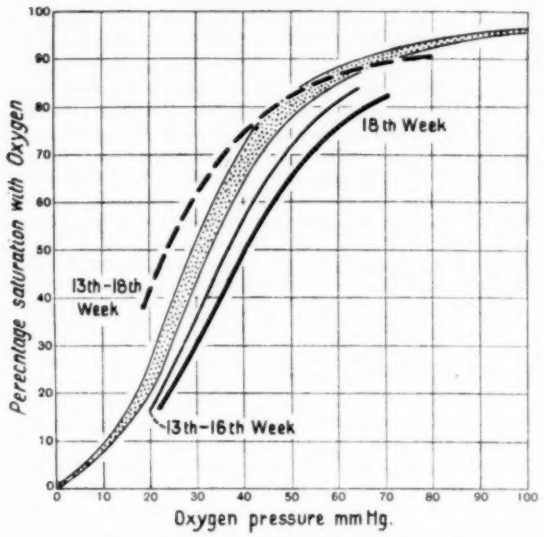

FIG. 4.—Comparison of fœtal and maternal curves. 50 mm. CO_2 pressure.

which incidentally we gather that at the end of pregnancy there is considerably more base in the fœtal than in the maternal blood; that, however, though important, is a digression. If the shift in the dissociation curve is not to be explained on the ground of increased alkalinity we must seek a solution in some other direction.

DIFFERENCES IN MATERNAL AND FŒTAL HÆMOGLOBIN

It is natural to ask whether the fundamental characters of the fœtal and maternal hæmoglobins are identical. In this connexion let us go back to the demonstrated abnormality in the inflections of the dissociation curve of the fœtal blood.

The natural extension of this observation is to prepare, from the fœtal and maternal bloods respectively, the corresponding hæmoglobins in a condition approximating to chemical purity. This has been done by Adair and McCarthy at a pH of 6·8. The result is somewhat remarkable. The oxygen dissociation curves of the hæmoglobins of this maternal and embryonic blood, when prepared and analysed under standard conditions, showed differences of just the same type as the bloods of the animals from which the samples of hæmoglobin were prepared. The same was true when the hæmoglobin was dissolved in quite dilute solutions and the estimations made by spectroscopic methods (Hall) instead of the van Slyke technique.

It may not be amiss to review certain indirect evidence which indicates that it is not unreasonable for the two to differ.

1. Reichert and Brown (1909) pointed out that there were in blood two forms of hæmoglobin.

2. Geiger, by a process of electrodialysis, separated from blood two hæmoglobins which had dissociation curves of different degrees of inflection; these, however, may have been artefacts.

3. The fœtal hæmoglobin is only in part made in the bone-marrow, and it is possible that the pigment made elsewhere—e.g., in the vascular cords of the mesoderm—may not be identical with that made in the marrow.

4. The vascular conditions in the fœtal circulation seem to be quite special. I have already called attention to the fact that the placenta has attained to a very high degree of development while the fœtus is still quite diminutive. In the tenth week of fœtal life the embryo is 100 g. in weight, but the blood volume of the fœtal circulation is 40 c.cm. Now it is clear that most of this blood must be not in fœtus but in the placenta, and that therefore the fœtal elements in the placenta (including the blood) develop pari passu with the placenta as a whole and in advance of the embryo itself.

Having digressed so far, may I be permitted to digress a little further. The development of the umbilical vessels appears to be related in time to that of the embryo rather than to that of the placenta. If the diameter of the umbilical veins is an indication of the amount of blood which transverses them in unit time, that volume corresponds to the fœtal development (Fig. 5). Hence the picture at the end of the tenth week is that of a large placenta, 40 c.cm. of blood shared between the placenta and the fœtus, but principally in the placenta, and circulating very slowly.

Although this blood is poor in hæmoglobin, yet it is so large in amount that the actual quantity of pigment is out of all proportion to the fœtus. The oxygen capacity of the blood in the fœtal circulation at this stage is 3 per cent. of the total fœtal volume, whilst at the end of the eighteenth week it is only 1 per cent. thereof.

5. It is well known that towards the end of fœtal life much of the hæmoglobin is broken down and the iron is stored in the liver to be rebuilt once more into blood pigment postnatally. In *icterus neonatorum* the blood is red not only of an *excess* of hæmoglobin engendered by oxygen-want in the fœtus (Anselmino and Hoffmann), but it is in part red also of the fœtal *type* of hæmoglobin—a type which acquires

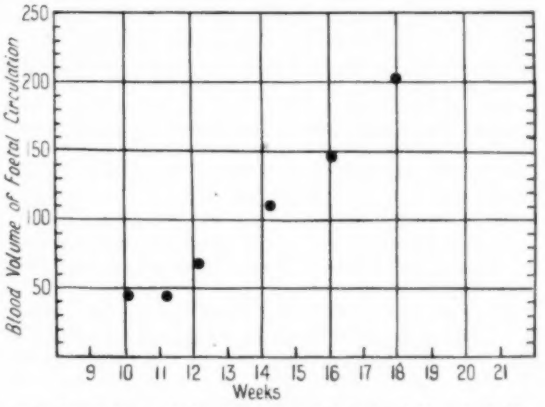

FIG. 5.—Volume of blood and the fœtal circulation, including the umbilical cord and fœtal vessels of the placenta.

oxygen with ease, though it sheds it with difficulty. In one phase it is appropriate to the condition of oxygen-want imposed on the fœtus; in the other phase it suffices for the vegetative existence of the embryo.

DEDUCTIONS FROM THE EXPERIMENTS

Having as I think set out some of the conditions of fœtal respiration, the question cannot be postponed

indefinitely. "What actually takes place within the limits of framework which has been revealed?" The answer is at present obscure, for while the data of numerous experiments is at hand the interpretation is difficult, and it is far from certain that the experiments are technically of sufficient merit to justify any interpretation whatever. But we may approach the problem and survey it even if we cannot solve it. Let me state to start with that the tension of oxygen in the blood which reaches the fœtus is not appreciably higher than in that which leaves the placenta for the mother. It is true that we have sometimes found an apparent excess of 2 or 3 mm.; against this however must be put the facts (1) that the two bloods were not drawn simultaneously, and (2) that the maternal blood analysed was only a sample emerging from two or three cotyledons. Our experiments furnished no convincing evidence of oxygen secretion on the great scale in the placenta.

In the thirteenth to sixteenth week it would be possible for the blood in the umbilical vein to have a saturation some 20 per cent. higher than that of the blood in the placental vein without the tension of the former exceeding that in the latter, or alternatively it would be possible at the same percentage saturation to have a pressure gradient of about 13 mm., and in the eighteenth week somewhat more. The trouble is that we have found, apparently, both pictures in the frame, and what is more disturbing we have found them both in the same animal. When with the maternal blood saturated about 50 per cent. to 60 per cent. you find the blood going to one of the twin embryo over 80 per cent. saturated, and three hours later, with little change in the maternal blood, that going to the other embryo 40 per cent. saturated, further inquiry rather than hasty deduction is demanded of the situation.

Let me therefore summarise.

It seems to be proved: (1) with regard to the *mother*, (*a*) that from about the middle of pregnancy onward, the dissociation curve shifts to the right, and (*b*) that the shift may be accounted for by an increase in the hydrogen-ion concentration of the maternal blood; (2) with regard to the *fœtus*, (*a*) that, on the whole, from about the same time, the dissociation curve of the fœtal blood at the relevant pressures of oxygen falls to the left of the normal position, and (*b*) that the shift is not due to abnormal alkalinity of the fœtal blood, for this is no more alkaline than that of the normal goat; (3) that the characteristic dissociation curve of fœtal blood is due to a specific form of hæmoglobin.

Again, it seems proved that during the latter part of pregnancy the blood of the fœtus is richer in base than that of the mother.

It is proved that the quantity of carbonic anhydrase in the fœtal blood is small as compared with that in the maternal blood, especially in the early stages, but the precise significance of this fact cannot be stated with certainty (Roughton).

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CARBOHYDRATE IN RELATION TO THE TREATMENT OF THYROTOXICOSIS

By Norman Kletz, M.B. Manch., M.R.C.P. Lond.

PHYSICIAN, ANCOATS HOSPITAL, MANCHESTER; PHYSICIAN AND HON. PATHOLOGIST, STOCKPORT INFIRMARY

The treatment of thyrotoxicosis resolves itself into one or other of three alternatives. It is a matter of fairly general agreement that, except in a limited number of mild or incomplete cases, medical measures require to be supplemented either by radiation of the thyroid or its operative removal. In every case medical measures are of paramount importance, whether representing the whole of the therapeutic procedures or as a preliminary to more vigorous methods. Particularly is this so in relation to pre-operative preparation and post-operative treatment. The value of iodine in this direction is undoubted, but the question of diet also appears to be of some importance.

It is a striking characteristic of thyrotoxicosis that in the majority of cases a good, and even abnormally good, appetite is retained in spite of the loss of weight; indeed, apart from diabetes mellitus, this combination of facts is almost diagnostic of thyrotoxicosis. That the diet, therefore, requires to be of a high calorific value is obvious, but its optimum constitution is a matter of discussion.

Joll [1] does not appear to consider that any specific adjustment is indicated, though he adds that "carbohydrates may usually be given freely." Many observers have advised restriction of protein because of the belief that protein accelerates metabolism.

Kommerell [2] observed 24 patients on a diet in which there was practically no protein, but which was almost entirely carbohydrate, and found considerable benefit. This benefit he attributes to the restriction of protein; it is, however, to be noted that the diet used was almost entirely carbohydrate. Moll [3] called attention to the value of a carbohydrate predominance in the diet. His main reason for this adjustment appears to have been that of digestive efficiency. He had observed—and the observation has been confirmed—the frequent association of achlorhydria or hypochlorhydria with thyrotoxicosis, and regarded such secretory peculiarity as an important factor in the causation of the dyspeptic symptoms so frequently found in the condition. It is a point of discussion, however, whether the dyspeptic symptoms are to be thus explained, or whether they are more correctly to be attributed to neuromuscular disturbances readily to be expected in a condition of such profound sympathetic upset. Nevertheless, Moll was of opinion that a carbohydrate-rich diet is beneficial in treatment.

THE RELATIONSHIP BETWEEN THE THYROID AND CARBOHYDRATE METABOLISM

The favourable influence of carbohydrate appears to be in three directions.

First.—Improvement has been more rapid and more complete when patients have been treated with a rich carbohydrate diet and iodine than when they have been treated with iodine alone. This may be purely attributable to the general fact that carbohydrates are easily metabolised and assimilated. It is suggested that the value is more specific.

There is much evidence of a relationship between the thyroid and carbohydrate metabolism. Eppinger, Falta, and Rudinger [4] maintained that, in the absence of the thyroid, glycosuria was not produced by the

injection of adrenaline into dogs, and that adrenaline hyperglycæmia was less in thyroidectomised dogs. Cramer and Krause [5] showed that the addition of thyroid gland to the diet of cats and rats produced a total disappearance of glycogen from the liver, an observation which was confirmed by Kuriyama.[6] A further general relationship was suggested by the work of Denis, Aub, and Minot,[7] who showed that, although a fasting hyperglycæmia is rarely associated with hyperthyroidism, alimentary hyperglycæmia was observed in every instance. Bodansky [8] demonstrated a rise in blood-sugar by administering thyroxine to sheep. Burns and Marks [9] from their experiments showed that :—

(*a*) Thyroidectomy diminishes the hyperglycæmic reaction to adrenaline.

(*b*) Thyroid feeding, so long as the glycogen store of the liver is not diminished, increases the hyperglycæmic reaction to adrenaline and diminishes the hypoglycæmic reaction to insulin.

(*c*) When, as a result of prolonged thyroid feeding, the liver glycogen disappears, the hyperglycæmic reaction to adrenaline diminishes and the hypoglycæmic reaction to insulin increases.

In a further paper Marks [10] restates these views and sums up by saying that "one of the effects of increasing the amount of thyroid hormone in the body is to render the liver more sensitive to such stimuli as promote glycogenolysis and discharge of sugar into the blood stream, and, conversely, that elimination of the hormone by thyroidectomy diminishes the readiness with which the liver converts its glycogen into sugar."

Abderhalden and Wertheimer [11] indicated similar results—namely, that thyroxine or thyroid substance given to dogs, rabbits, guinea-pigs, rats, and mice caused a reduction of the glycogen content of the animal, especially marked in the liver and leading to complete utilisation of the carbohydrate stored in that organ.

A further important relationship is that of hyperthyroidism and diabetes. Joslin,[12] in an analysis of 3869 patients operated upon for thyroid disease, of whom 2406 had thyrotoxicosis, found the incidence of diabetes to be 3·15 per cent. John [13] has reviewed the whole subject. He quotes figures from the literature showing the incidence of hyperthyroidism in diabetes to be an average of 1·68 per cent., and the incidence of diabetes in hyperthyroidism to be an average of 2·31 per cent. The incidence of hyperglycæmia in hyperthyroidism is, of course, higher. In John's 9000 personally observed cases of thyroid disease, mainly with hyperthyroidism, the incidence of hyperglycæmia was 6·8 per cent. Further observation proved many of these to be non-diabetic, the ultimate percentage of true diabetes being 2·1.

It is probable that where diabetes follows or complicates hyperthyroidism, there existed in the individual the predisposition or "Anlage" to diabetes, precipitated into the developed diabetic state by the metabolic disturbance induced by the hyperthyroidism. It is interesting to note that there is no constant relationship between the severity of the thyrotoxic symptoms and the development of diabetes.

These facts are of great importance because, clearly, if a diabetic state exists, the use of very rich carbohydrate diets would be disadvantageous. Where glycosuria or hyperglycæmia is found, the case should be fully reviewed with the necessary blood-sugar observations, and any carbohydrate bias in the diet should be supported by adequate dosage of insulin.

The general deduction from the experimental work outlined above is that in thyrotoxicosis there is a constant tendency to depletion of liver glycogen. A rich carbohydrate diet would assist in maintaining the requisite glycogen reserves. The general value of sparing tissue proteins is no doubt also of importance.

Secondly.—Pre-operative preparation has been more satisfactory and post-operative crises less severe.

Thirdly.—Where crises, and even those of intense severity, have occurred, the administration of carbohydrate in the form of glucose has produced resolution of the grave symptoms.

Frazier [14] supports this view on the basis of clinical and experimental evidence and recommends glucose administration, particularly as an immediate pre- and post-operative procedure. He is, however, opposed to the administration of glucose in too high a concentration, because the object is to replenish the glycogen stores of the liver, which cannot be effected unless adequate fluid is available. Maranon [15] considers that emptying of the glycogen reservoirs is the cause of the diarrhœa, vomiting, and even the jaundice and coma which may occur in thyrotoxicosis and its post-operative crises; clearly a further support for the value of carbohydrate in large quantities.

It has been shown by several observers that anæsthesia, especially if prolonged, leads to hyperglycæmia by mobilising glycogen reserves. As already indicated, thyrotoxicosis, even apart from anæsthesia, tends to deplete these reserves. Such depletion is likely to be even more extreme as a result of the acute post-operative thyrotoxic disturbance. Adequate glucose administration immediately before and after operation would therefore appear to be logical. Further, glucose would tend to minimise any general tendency to post-operative acidosis. Finally, if, as seems probable, acute hypoglycæmia plays a part, at any rate, in the post-operative disturbances of thyroidectomy, glucose administration should be of value in promoting the resolution of such symptoms.

ILLUSTRATIVE CASES

CASE 1.—Mrs. A, aged 28, a case of primary toxicosis of 18 months' duration. The weight had gone down from 9 st. 4 lb. to 6 st. 2 lb. There was auricular fibrillation with a ventricular rate of 164. The maximal cardiac impulse was in the sixth left interspace almost in the mid-axillary line, with enlargement of the area of cardiac dullness to the right of the sternum. This patient had been previously treated elsewhere by rest and iodine without any improvement. She was herself impressed by the great improvement experienced on the régime detailed below. Operation was performed after 15 days. A few hours after the operation a severe crisis began to develop. Intravenous glucose was administered, with rapid resolution of symptoms and a subsequently uneventful recovery. It is interesting to note that, apart from striking general improvement, the fibrillation has now disappeared.

CASE 2.—Mr. B, aged 28, a severe case previously treated elsewhere by iodine followed by X rays. In spite of preparation this patient developed the most severe post-operative crisis which we have ever experienced. He was semi-conscious and delirious, with profound vomiting and jaundice; the urine contained albumin, blood, and bile. Glucose was given rectally and intravenously, together with iodine by stomach-tube. The position appeared hopeless but he came round. He has made a complete recovery and is putting on weight rapidly. Though in this case the procedure suggested did not prevent a very grave crisis, it appears very doubtful whether a fatal issue could have been prevented without them. In any event, the value of glucose when the crisis was already established seems definite.

CASE 3.—Mrs. C, aged 28. This patient when first seen was regarded as a mild case, and after a preliminary period of three weeks in bed on iodine and diet was given X ray treatment. After the third treatment she developed an

acute thyrotoxic reaction with marked vomiting. Her pulse-rate was 172. She was given glucose and saline intravenously, and glucose, saline, and Lugol's iodine per rectum. Recovery was very rapid from this emergency and she was prepared for operation. After the operation there was a severe crisis with vomiting, moderate pyrexia, and great increase in the heart-rate. Two intravenous injections of glucose were given with rapid resolution of symptoms. Subsequent progress was uneventful and satisfactory.

During the last three years 95 cases of thyrotoxicosis have been treated. Many of them were of a mild type treated by rest, iodine, and diet, with or without subsequent radiation of the gland. Of these, 53 cases were regarded as severe, and 38 were submitted to operation; in the remaining 15, operation was refused and most were treated by prolonged radiation. Of the 38 operation cases 3 died; 31 were primary and 7 secondary; 28 were females; the youngest was 15½ years old and 2 were over 50. The duration of symptoms varied from 3 months to 11 years. Ten were males, 3 of whom were over 50; duration of symptoms varied from 6 months to 3 years. Four cases—all women—had auricular fibrillation of some standing.

THE BASIC DIET

In all these cases a similar routine has been employed: a diet very rich in carbohydrate, including honey and glucose, together with Lugol's iodine in varying dosage until the optimum point was considered to have been reached. One hour before operation 1 to 2 oz. of glucose was given, together with 20 to 30 minims of Lugol's iodine, a somewhat similar dosage being repeated two to three hours after operation. Glucose administration was continued for 36 to 48 hours and the iodine in gradually diminishing dosage for seven days. The basic diet—practically identical with that of Moll—was the following. As mentioned, glucose and honey were added as far as the patients were able to tolerate them.

DIET OF HIGH CARBOHYDRATE VALUE

6 A.M.	Oatmeal porridge, with ½ oz. cream and two teaspoonfuls sugar.	
	Tea, with 1 oz. milk.	
	Butter	½ oz.
	Honey or jam	1 oz.
	Bread (white)	3 slices.
	Fruit: Bananas, grapes or prunes, pears, apples, and oranges.	
8 A.M.	Horlick's malted milk	6 oz.
	Bread	2 slices.
	Honey	½ oz.
10 A.M.	Milk, 8 oz., with one beaten egg and two teaspoonfuls sugar.	
12 noon.	*Lunch:*	
	Underdone beef, sweetbreads, chicken, rabbit	2 oz.
	Fish: cod, hake, haddock, whiting, plaice, and soles	2½ oz.
	Potatoes, peas, parsnips, turnips, carrots	6 oz.
	Bread	2 slices.
	Milk	6 oz.
	Milk pudding	4 oz.
4 P.M.	Dextri-maltose (Mead's).	
	Milk	8 oz.
	Tea: The same as breakfast, but no porridge.	
	Before bed: Glass of Horlick's malted milk, a couple of biscuits, and ½ oz. of butter.	

These quantities are regarded as an average, and patients are allowed more if they desire it.

CASE 4.—Mrs. D, aged 52 years, a very severe case, who had been seen some months previously when operation was advised but refused. This patient was admitted in a state of extreme emaciation, delirious, and fibrillating, with a ventricular rate of about 180 per minute. For several days she was given glucose and subcutaneous salines; iodine and coramine 1 c.cm. was injected every four hours. She was later put on the diet with considerable amounts of glucose. Before operation the ventricular rate was between 90 and 100. The highest temperature recorded after the operation was 99·04° F., and the highest ventricular rate was 130, which lasted for an hour or so and rapidly fell to 100 or just below. There was no anxiety about her condition. Some packing had been left in the wound, and when this was removed and replaced two days and six days after the operation there was a transient rise of pulse-rate and temperature.

CASE 5.—Miss E, aged 37, a case which had relapsed after previous medical treatment and radiation. There was no appreciable post-operative crisis. The highest temperature recorded during the 48 hours after operation was 99·04° F., and the highest pulse-rate 120. No anxious or disturbing symptoms occurred.

CASE 6.—Mrs. F, aged 30, a very severe case, fibrillating; weight 8 st. 1 lb. During the 48 hours after operation the temperature rose as high as 101° F., and the heart-rate varied between 110 and 130. There were no anxious symptoms and subsequent progress was perfectly uneventful.

CASE 7.—Mr. G, aged 45. Three years' history; had lost 3 st. in the last two years. Operated on after 19 days' preparation. For 48 hours after operation the temperature was 99° F., and for a short time the pulse-rate was 120, rapidly falling to below 100. At no time was there any real disturbance nor the slightest anxiety.

CASE 8.—Miss H, aged 41; 18 months' history. Diet and iodine for 16 days. For 48 hours after operation temperature between 99° F. and 100° F. Pulse-rate before operation 100; for 12 hours after operation rose to 120, falling within 48 hours to 90. No disturbing symptoms. Recovery uneventful.

My thanks are due to Mr. P. G. McEvedy and Mr. R. L. Newell, who have operated upon the majority of the patients.

Since this article was written ten more cases have been operated upon in a similar way with successful results.

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PERONEAL MUSCULAR ATROPHY IN FIVE GENERATIONS

BY IAN GORDON, B.Sc., M.B. ABERD.
LATE HOUSE PHYSICIAN, ABERDEEN ROYAL INFIRMARY

PERONEAL muscular atrophy of the Charcot-Marie Tooth type is a rare disease. The object of this paper is to record, first, a family tree, tracing the disease through five generations (Fig. 1); and secondly, a detailed study of two members of the family. The tree was compiled from reliable information obtained from the two patients whose cases are described.

THE TWO CASES

CASE 1 (E 5 in the family tree).—A sawyer, aged 46, was admitted on May 23rd, 1933, to Dr. W. F. Croll's ward at the Royal Infirmary, Aberdeen. Apart from pleurisy and pneumonia at the age of 12, and a few attacks of influenza, he had led a healthy and active life. When 20 years old he noticed he had difficulty in putting on his boots, and that his feet "flapped about" when he walked. Since then he has complained of increasing wasting and weakness of the legs, with occasional shooting pains in the arms and legs. A short time after he had difficulty in walking he observed that his grip in both hands was weaker. He has two children, a boy of 18 and a girl of 14, neither of whom seems to be affected.

The patient is healthy looking and well nourished. The mental functions are normal and there is no impairment of speech. The optic discs and fundi are normal. The visual acuity is good and the fields of vision full to hand movements. The pupils are central, of medium size, circular, equal, and react to light and on accommodation. The eye movements are full and there is no nystagmus. The remaining cranial nerves are normal. The muscles of the face are not wasted.

There is a very fine tremor of the outstretched hands, and well-marked fibrillary tremors are to be seen in the muscles of the forearms, arms, legs, and thighs. The hands (Fig. 2) show wasting of the interossei, the muscles of the thenar eminences, and, to a less extent, of the hypothenar eminences. There is diminished power in adduction and abduction of the thumb, and the patient experiences great difficulty in picking up small objects, such as pins, matches, &c. The muscles of the forearms are not obviously wasted. Muscular atrophy is conspicuous however in all the muscles of the legs and feet, especially in the peronei. The thigh muscles have escaped. Bilateral talipes equinovarus and pes cavus are present (Fig. 3). The feet are held in the claw position, with the toes hyperextended at the metatarso-phalangeal joints and flexed at the interphalangeal joints. The patient has great difficulty in performing the heel and toe test, probably because of the muscular atrophy. Romberg's sign is positive. He walks on the outer borders of the feet where there are large callosities, and his gait reveals some degree of foot-drop. He is unable to dorsiflex the feet, but the power of plantar flexion is fairly good.

FIG. 3 (Case 1).—The deformity of the feet.

Sensation to cotton-wool and pin-prick is normal. Temperature sense shows no impairment. Joint, deep pressure, and vibration senses are normal, and the sense of position is within normal limits. The biceps and triceps jerks are active and equal, but the supinator jerks are absent. Abdominal reflexes are present and equal. Knee-jerks are active and equal, ankle-jerks are absent, and the plantar responses flexor. Organic reflexes are normal.

There is no response to faradism in the anterior tibial and peroneal muscles. Calf muscles respond slightly. Thigh muscles react normally. The interossei respond only to a strong current. No response in the thenar muscles. The flexors and extensors of the forearms and muscles of the upper arms and shoulders give a normal response.

The Wassermann reaction of the blood and spinal fluid is negative. Examination of the cardiovascular, alimentary, respiratory, and renal systems revealed nothing abnormal.

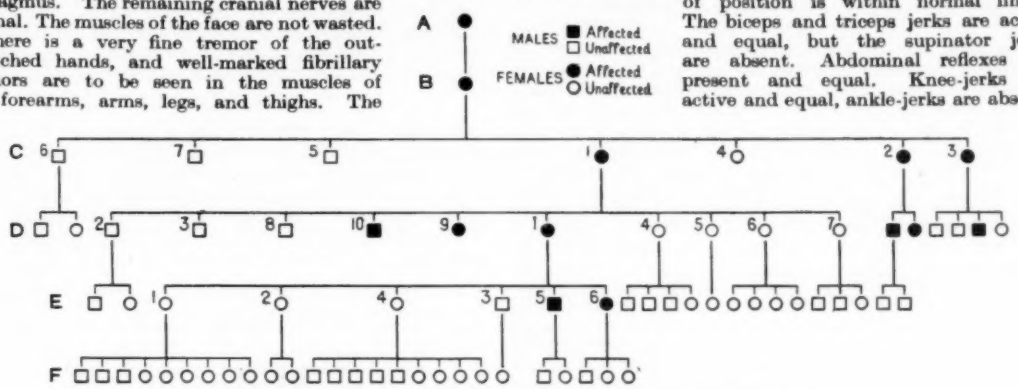

FIG. 1.—Family tree showing incidence of peroneal muscular atrophy.

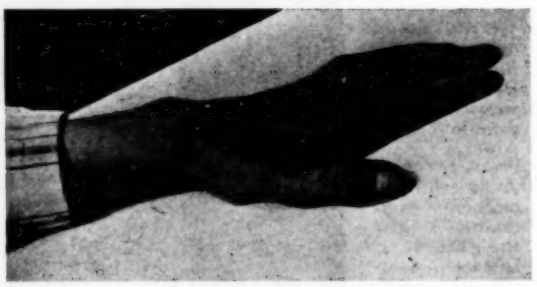

FIG. 2 (Case 1).—Photograph showing wasting of the muscles of the thumb.

CASE 2 (son of C 4 and cousin of the mother of the first patient).—Admitted on August 28th, 1933. A farmer, aged 53, he presents a picture of a more advanced stage of the disease. He has two sons aged 6 and 2 years, who are both perfectly normal children. He was troubled with sore-throats in his youth, suffered from measles at the age of 47, and had whooping-cough two years ago. For the last 20 years he has complained of mild attacks of bronchitis and asthma. About the age of 18 he noticed he had difficulty in walking, which, he states, was due to "ankle-drop" and which has become progressively worse. About the same time he observed that his legs, which had never been well developed, were getting thinner. He has had progressive wasting of the muscles of the hands for over ten years. He has never noticed fibrillary tremors and has never complained of pains in the limbs.

The patient is a thin but healthy looking man of the wiry type. The mental functions are good. Optic discs

and fundi are normal. Nystagmoid jerks are present on looking to the right and left. The cranial nerves are normal.

Fibrillary tremors are evident in the muscles of the forearms and thighs. There is marked wasting of the interossei and muscles of the thenar and hypothenar

FIG. 4 (Case 2).—To show wasting of the interossei.

eminences (Fig. 4), with corresponding weakness in adduction and abduction of the thumbs. The forearm muscles are normal. There is a slight degree of pes cavus and claw-foot. The patient walks on the soles of the feet with the characteristic drop-foot gait. Drop-foot is so marked that he can only walk about with comfort by maintaining the feet in dorsiflexion by means of bandages. The muscles of the legs and lower third of the thighs show extreme wasting, especially in the distal portions (Fig. 5). Dorsiflexion of the feet is impossible, but there is a fair amount of power remaining in the calf muscles.

Sensation to cotton-wool, pin-prick, and thermal stimuli is normal. Sense of position, joint, deep pressure, and vibration senses are normal. Biceps and supinator jerks are absent, and triceps jerks are present but feeble. Abdominal reflexes are normal. Knee- and ankle-jerks are absent. Plantar responses are flexor. Organic reflexes are unimpaired.

The peronei react to faradism better than any of the other leg muscles, but still very feebly. In the left leg tibialis anticus and extensors of the toes give a still feebler reaction. In the right leg there is no response. The calf muscles and intrinsic muscles of the feet react feebly. Thigh muscles react normally. Forearm muscles give a normal response. In the hands all the intrinsic muscles react well, except the opponens and adductors of both thumbs which require almost full current to produce a very feeble response.

The Wassermann reaction of the blood is negative and the cerebro-spinal fluid is normal. Examination of the lungs reveals some pulmonary fibrosis and emphysema. Examination of all other systems is negative.

In neither of these cases was there any obvious thinning of the shafts of the bones. Radiography of the tarsus, tibia, fibula, and femur, in both cases controlled by a similar examination of a healthy patient of the same age and build, showed nothing abnormal. Currie [1] in 1927 described the disease in a boy aged 9 years. He demonstrated radiologically that the bones were distinctly more transparent than normal, and he drew attention to the marked atrophy in the shafts of the femora and in the bones of the forearms and legs.

As the disease in the two cases described did not manifest itself until the ages of 20 and 18 years respectively, when the shafts of the long bones are nearly fully developed, it is not surprising to find the bones of normal size and density. It seems probable that when the disease begins in childhood, consequent on the atrophy of the anterior horn cells, there is retardation of growth in the corresponding long bones.

THE CLASSICAL TYPE

The disease was described in 1886 by Charcot and Marie,[2] and in the same year in this country by Tooth.[3] Tooth, in his thesis based upon five personally observed cases, states that although the peroneal muscles are usually first affected the wasting may commence in any of the other muscles of the leg. The deformity of the foot depends on the order of involvement of the various muscles. If the intrinsic muscles of the foot are first attacked pes cavus will occur. Symonds and Shaw [4] have described ten cases in the same family of "formes frustes" of the Charcot-Marie-Tooth disease. The atrophy commenced in the intrinsic muscles of the feet and became arrested at that stage. Bilateral pes cavus occurred in all cases. Similar cases have been described by Roussy and Lévy.[5] Wasting of the tibialis anticus and extensors of the toes will produce drop-foot. This is the lesion shown by the second case, whose peronei were least affected of all the leg muscles. When the peronei are earliest affected equinovarus will result, and this is the deformity described by Charcot, Marie, and Tooth. The first case, which shows marked equinovarus, appears to belong to the more classical type of the disease.

GENETIC ASPECTS

Of the other members of the family who have shown signs of the disease all are dead except three. Two of these are abroad. The other (E 6), aged 42, a sister of the first patient, shows only slight wasting of the peronei and slight difficulty in walking on account of foot-drop, which she has noticed for a few years.

A. and B.—Both died in old age. Muscles of legs and hands markedly wasted.

C 1.—Condition similar to Case 1 (E 5). Died aged over 70.

C 2.—Had wasted legs and foot-drop. Muscles of hands were also wasted. Died aged 82.

Daughter of C 2. — Slight difficulty in walking on account of a claw-foot and foot-drop. A thin woman, aged 48.

C 3. — Condition of feet unknown. Hands showed wasting with definite loss of power.

Son of C 3.— A school teacher, condition similar to Case 1. Disease commenced in youth and progressed to an advanced stage. Had pes cavus and equinovarus. Died aged 50–60.

FIG. 5 (Case 2).—Extreme wasting of the muscles of the leg.

D 1.—Similar to Case 1. Disease began at age of about 50. Died aged 72.

D 9.—Weakness and wasting of legs commenced in youth and progressed to an advanced age. Died aged 72.

D 10.—Similar to Case 1. Disease commenced in his youth. Aged about 70.

Heredity is an important though not a constant

feature of the disease. Herringham [6] in 1888 reported a family in which only males were affected, the disease being transmitted by healthy females. Raffan [7] in 1907 described a typical case, traced the disease through five generations, and noted that it descended through affected and unaffected females. From a study of the disease in this family it appears that only affected females transmit the disease both to their male and female progeny.

Patients with progressive muscular dystrophy show creatinuria even on a purine-free diet, and patients with myasthenia gravis also excrete small amounts of creatine—a substance not found in normal adult's urine. It is interesting to note that both the patients whose cases are above described excrete small amounts of creatine. On a purine-free diet Case 1 excreted 0·087 g. of creatine in 24 hours (5·785 g. per kg. of body-weight). On a similar diet Case 2 excreted 0·055 g. of creatine in 24 hours (2·799 g. per kg.). In view of the recent successful treatment of the muscular dystrophies [8] and myasthenia gravis [9] with glycine, one patient (Case 1) is being treated with 10 g. twice daily.

My thanks are due to Sir Ashley Mackintosh for his kindness in seeing the cases, and to Dr. W. F. Croll for his permission to publish them.

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CASES OF AURAL VERTIGO
AMENABLE TO TREATMENT BY OSSICULECTOMY

By Sir James Dundas-Grant, K.B.E., M.D. Edin., F.R.C.S. Eng.

CONSULTING SURGEON TO CENTRAL LONDON THROAT AND EAR HOSPITAL; CONSULTING LARYNGOLOGIST TO CANCER HOSPITAL AND TO HOSPITAL FOR CONSUMPTION, BROMPTON

Vertigo is a symptom or disease which is so distressing and often disabling that no mode of approach to its elucidation can be neglected. The family doctor, the general physician, the neurologist, and the ophthalmologist study it from their several points of view and can count their successes, but in many instances it remains for the aurist to ferret out the causal factor, and, as the following cases show, to carry out appropriate means of cure. The means may often be of the simplest nature, but in cases in which post-inflammatory changes have caused fixation of the ossicles or have led to the formation of desquamative masses in the attic and their damming up by these bonelets, the removal of the ossicles offers a direct way out and an end to the vertigo.

Ossiculectomy appears to have been relegated to the category of the "out of date," but I am convinced that in suitable cases it is of the utmost value. Possibly too much has been expected of it as doing away with the necessity for the radical mastoid operation. This it cannot do, but in certain cases presenting symptoms indicating radical procedure the operation of ossiculectomy has relieved these symptoms and shown the radical operation to have been avoidable. Again there will always be room for such operations as obliteration of the labyrinth or section of the eighth nerve on account of vertigo, but before such serious interventions are considered, the possibility of the case being amenable to treatment by the comparatively innocuous operation of ossiculectomy must be carefully considered and the first witness to be called should be the ear itself.

Fairly often the practised eye will detect changes attributable to retractions of the membrane or fixation of parts produced by the residua of inflammation in the middle ear. In some of the cases I am here describing the ossicles obstructed the outlet of the attic and prevented the escape of thickened discharges or cholesteatomatous collections, and in others their fixation led to immobility of an otherwise mobile stapes. In the former the removal of the ossicles permitted the free escape of contents of the attic, with relief from vertigo, headache, and to some extent from dullness of hearing. In the latter the restored mobility of the stapes provided the normal safety-valve for variations of intralabyrinthine tension, with disappearance of the distressing vertigo.

The number is not very large, although the series has extended over many years, the reason being that the appropriate cases are comparatively uncommon. This is perhaps the reason why they have not forced themselves upon the notice of those who have allowed ossiculectomy to lapse into a disuse from which I have every expectation that it will be withdrawn. The following are the notes of what is as nearly as possible a complete series of the cases in which I have treated aural vertigo by means of ossiculectomy.

Case 1. *Vertigo and epileptiform seizures completely arrested by ossiculectomy.*—A man, then aged 30, was referred to me in 1907 by Dr. Outterson Wood on account of attacks of epileptiform character and intense vertigo accompanied at times by definite loss of consciousness. The attacks were of two kinds, one preceded by a feeling of pressure behind the ear, after which the patient fell over, and the other with absolutely no warning at all, in which he suddenly fell down with loss of consciousness. The attacks came on about three or four times a week. He had had deafness in the left ear since the age of 8 or 9 years, but never remembered having had a discharge. Examination showed a depression, corresponding to a former perforation behind the malleus, in which the stapes was visible with a sunken cicatrix attached to it; it was then noted that there was giddiness when Siegel's suction speculum was employed. He was at first treated with quinine internally and, for his ear, drops to dry up the desquamative products. On March 1st, 1907, I performed ossiculectomy, as the ossicles were not serving any purpose and blocked up the passage from which the desquamative products might escape. From that time he has been entirely free from the attacks. The fenestra ovalis is now exposed, the stapes having become detached. Labyrinthine reaction to cold is excessive, and suction with Siegel's speculum acting on the exposed fenestra ovalis causes such intense postural disturbance as almost to make him fall off his chair. (Shown last before Neurol. Sect., Roy. Soc. Med., Nov. 24th, 1932.)

Case 2. *Vertigo, probably epileptic, with cholesteatoma, greatly relieved by ossiculectomy.*—A school-mistress, then aged 40, first seen in April, 1910, complained of attacks of vertigo with loss of consciousness and occasional double vision, two or three times a month for several months. At 4 o'clock the previous morning she had an attack in which her arms became stiff for about a minute; this was followed by very loud snoring and she was unconscious for about 15 minutes; at noon she had a very light dinner followed by vomiting and during the whole day suffered severely from headache. She occasionally lost the vision of the right eye for about two minutes and had attacks of double vision two or three times a week. The ear had discharged with pus on and off since childhood. On

examination the left ear was found full of cerumen and the hearing for the whisper was reduced to 3 in.; after this was removed she could hear at 2 ft., but there was found to be a large perforation in the attic through which desquamative material protruded; it was obvious that the cholesteatomatous material was being dammed up by the ossicles. Ossiculectomy was performed, and from that time she has been free from pain and any vertigo beyond an occasional slight "swimminess." This is probably a mild form of epilepsy and is kept off by small doses of luminal. At present she enjoys good health. The hearing is about the same as before the operation. (Shown Otol. Sect., Roy. Soc. Med., Oct. 21st, 1921.)

CASE 3. *Vertigo caused by cholesteatomatous formations, cured by ossiculectomy.*—The wife of a medical man, then aged 40, had had discharge from the right ear for many years. When seen in 1915 she was suffering from headache and attacks of giddiness. The anterior half of the membrane was absent and cholesteatomatous material protruded through the perforation. She was relieved for a time by the instillation of alcohol drops, but her giddiness became unbearable and I removed the ossicles in November, 1915. Since then the vertigo has entirely disappeared. The hearing is better than before the ossiculectomy. At present she is in good health.

FIGS. 1 2 3 4.

FIG. 1 (Case 4).—Cholesteatoma protruding from attic and below. FIG. 2 (Case 8).—Postero-superior perforation; granulations; white skin indicating presence of cholesteatoma. FIG. 3 (Case 11).—Cholesteatoma protruding from large attic opening. FIG. 4 (Case 12).—Membrane round head of stapes indrawn; ossicles fixed.

CASE 4. *Vertigo and headache caused by cholesteatoma in the attic.*—A maid, then aged 21, was the subject of violent attacks of giddiness and headache with suppuration in the left ear of several years' standing. The lower part of the membrane was absent and there was also a large perforation in the region of the attic; a mass of cholesteatomatous material bulged from the latter opening and also below and in front of the neck of the malleus (Fig. 1); it was very difficult to remove these masses and they could not be spontaneously extruded owing to the obstruction caused by the presence of the ossicles. Her hearing was reduced to a few inches for the whisper. After the removal of the ossicles in 1918 the attacks of vertigo disappeared and have not returned; there is very little discharge from the ear and only occasional slight headache. The hearing has considerably improved. (Shown Otol. Sect., Roy. Soc. Med., Nov. 21st, 1919.)

CASE 5. *Headache and vertigo due to cholesteatoma, temporarily relieved by incomplete ossiculectomy, permanently relieved by the complete operation.*—The patient, a man aged 38, suffered from headache and attacks of vertigo which rendered him incapable of following his profession. He was in a state of pitiable depression and found life almost unbearable. His was a case of cholesteatoma limited and, as it were, dammed up by the ossicles. Very slight relief followed the desiccating effect of alcoholic drops and (in 1919) ossiculectomy was decided on. Owing, however, to anæsthetic difficulties and to imperfect adrenalisation the malleus alone was extracted, the incus remaining behind. The patient was considerably relieved and recovered his confidence in himself to such a degree as to get married, but before long his vertiginous attacks recurred. Under careful local anæsthesia I removed the incus and his headache and vertigo disappeared completely.

CASE 6. *Vertigo from disease in attic, relieved by ossiculectomy.*—A middle-aged pensioner had suffered from deafness and discharge from the right ear of about 2½ years' duration. In August, 1919, he developed attacks of giddiness. There was evidence of disease in the attic. As his hearing was extremely poor I decided to try the effect of ossiculectomy before resorting to the radical mastoid operation, the necessity for which seemed very probable. A week later he reported himself as feeling much easier, and when seen a few months later the tympanum looked very clean and healthy and he was free from giddiness. (Shown Otol. Sect., Roy. Soc. Med., Nov. 21st, 1919.)

CASE 7. *Vertigo, with fixation of the ossicles, cured by ossiculectomy.*—A bank clerk, aged 24, suffered from frequent attacks of giddiness so severe as to make him fall down. He had chronic suppuration in the left ear, which was satisfactorily dealt with by a modified mastoid operation, but the vertiginous attacks persisted and it was found that they were excited by the slightest pressure on the right tragus. The right malleus was found to be absolutely tied down to the promontory by cicatricial adhesions. After the removal of the ossicles the vertigo disappeared almost entirely and it could no longer be induced by pressure on the tragus. The probable explanation of the relief is that the malleus fixation rendered the incus and stapes immobile and that the pressure of air when the tragus was pushed in acted upon the membrane of the round window to an abnormal degree, producing extreme disturbance of the internal ear owing to the loss of the safety-valve action of the stapes in the fenestra ovalis. As soon as the ossicles were removed, the fenestra ovalis recovered its mobility and again acted as a safety-valve, with disappearance of the vertigo. The hearing-power for the whisper on the right side improved from 5 ft. (before) up to 20 ft. (after the operation) when the opposite ear was deafened by means of Bárány's noise machine. (Shown Otol. Sect., Roy. Soc. Med., Jan. 19th, 1923.)

CASE 8. *Deafness, headache, and giddiness causing incapacity to carry on her profession of teaching. Completely relieved after extraction of ossicles.*—A missionary teacher, then aged 48, had been sent home from India on account of her aural trouble. For 30 years she had suffered from discharge from the left ear with severe giddiness on the slightest interference, such as syringing. The postero-inferior third of the membrane was absent. Some fleshy granulations protruded along the posterior margin of the tympanic ring and, between the malleus and these granulations, there could be seen white skins which indicated the presence of cholesteatomatous formations in the attic (Fig. 2). I forced out a polypus and removed it with a fine snare. The vertigo increased and only ceased completely when, in January, 1924, I performed ossiculectomy. She returned to India where she continued her profession as a teacher. In a letter dated March, 1930, she stated that she had had no return of her trouble. Hearing the same before and after operation. (Shown Otol. Sect., Roy. Soc. Med., March 8th, 1924.)

CASE 9. *Otorrhœa with headache and slight giddiness. Complete disappearance after removal of the ossicles.*—A man, aged 37, complained of discharge from the ear and headache dating from before the war. Since the war he had suffered from giddiness and "fear of living" which interfered with the performance of his duties as a clerk. I found a mass of desquamative products dammed up by the ossicles. The use of alcohol drops had little effect, and it was only after extraction of the ossicles in October, 1926, that he obtained relief with very little discharge and better hearing than before the op ration. He carries on his work with no difficulty and with a feeling of well-being such as he had not experienced before.

(Shown at meeting of Post-Graduate Hostel, Nov. 1st, 1926.)

CASE 10. *Otorrhœa, deafness, slight vertigo. Recovery after removal of ossicles.*—A middle-aged lady had suffered from deafness and discharge on the left side, with slight giddiness, since childhood. The meatus was filled with pus mixed with cerumen. The inferior half of the left membrane was replaced by an adherent cicatrix. Between the malleus and the postero-superior border of the tympanic ring there was a large orifice filled with cholesteatomatous material which originated in the attic. She used alcohol drops for several months and eventually submitted to the operation of ossiculectomy which I had recommended. In December, 1926, I removed the ossicles and three months later there was no discharge, no giddiness, and great improvement in the hearing, the whisper being heard at 5 in. before the operation and at 20 ft. after it.

CASE 11. *Severe vertigo from attic cholesteatoma. Cured by ossiculectomy.*—A young man, aged 30, presented himself at the hospital in a state of such extreme giddiness that he could not walk without the help of a companion. He had been in bed for six weeks on account of the giddiness with vomiting and headache. He had suffered from discharge and deafness from childhood and had been subject to the giddiness for some years. There was a large opening in the attic filled with white cholesteatomatous masses (Fig. 3). After this had been cleared out and salicylic and alcohol applied, the giddiness disappeared. The discharge continued and reaccumulations took place, with giddiness, from time to time, requiring repeated clearance. In May, 1927, I removed the ossicles and from then onwards he has been free from accumulations and giddiness, the discharge becoming very slight and being kept in check by the use of alcohol drops. Hearing, if anything, slightly better than before operation. (Last shown Neurol. Sect., Roy. Soc. Med., Nov. 24th, 1932.)

CASE 12. *Attacks of vertigo. Completely relieved by ossiculectomy.*—A dental surgeon, aged 57, was referred to me on Jan. 1st, 1931, by Sir James Purves-Stewart for examination in case there might be an otological cause for attacks of vertigo occurring almost every other day and with greater severity during the last two months. There was no unconsciousness and he had never actually fallen. The attacks were ushered in by a feeling as if he had received a blow on the right side of the head with an inclination to fall to the right in slight attacks. There was no evidence of involvement of any part of the nervous system, the Wassermann reaction was negative, and there was no detectable abnormality except middle-ear deafness on the right side. One physician had attributed the vertigo to excessive tobacco-smoking and abstinence from this was practised for a month without any benefit beyond a lessening of the frequency of the attacks.

I found in the right ear intense indrawing of the membrane in front of the handle of the malleus which was drawn back and fixed to the inner wall of the tympanum. The head of the stapes was a little lower than normal, and the membrane around it was indrawn (Fig. 4). Whispered voice was only heard at 1 in. when Bárány's noise machine was applied to the good left ear. Bone-conduction was diminished and Galton was lowered to 3·1 as against 1·5 on the sound side. There was nystagmus to the left and slight Rombergism to the right. The cold air labyrinth reaction was normal as also the galvanic. Past-pointing was normal. The most obvious abnormality was the fixation of the ossicles. Ossiculectomy was accordingly decided on and I removed the malleus and incus completely in February, 1931. From that time on he was free from his old paroxysms. In July, 1931, and January, 1932, he reported that he had no discomfort and no trace of giddiness.

The operation is described more or less wholeheartedly in the text-books of otology, and obviously no practitioner would undertake it without having had considerable experience in intra-aural manipulation. I need, therefore, only say that for the extraction of the incus the hooks devised by Ludewig and Zeroni are often indispensable, but the one known as Hoffmann's has been in my hands the most generally efficacious (Fig. 5). This, after extraction of the malleus, is passed into the attic, hugging its inner wall, and is turned slightly backwards, then drawn outwards so as to catch the inner surface of the incus. Its edge is sufficiently sharp to adhere to the bone which is then drawn downwards and outwards.

The question naturally arises as to the effect on the hearing of the removal of the ossicles. In the normal subject such removal would probably reduce the hearing to about 6 ft. for the soft whisper, a useful but a much diminished amount of hearing-power. In a patient having a greater degree of hearing ossiculectomy would, therefore, be undesirable unless called for by a major disability, the removal of which rendered a moderate reduction of hearing a matter of relatively minor importance. In most of the cases in which ossiculectomy is required the hearing power is less than this and the operation, while making it no worse, sometimes makes it better than before, as in the cases I have narrated.

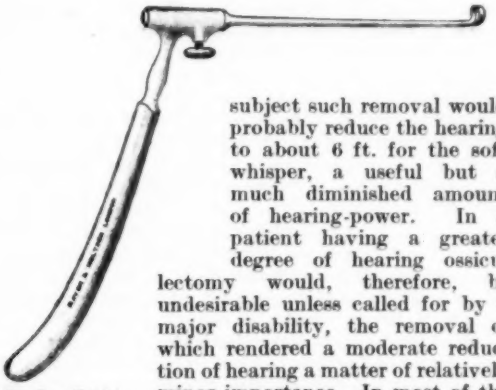

FIG. 5.—Hoffmann's incus curette.

I do not wish to suggest that the indications for ossiculectomy are very frequent or that they often do away with the call for the mastoid operation. Indeed, it is most important that valuable time should not be lost in watching for the results of ossiculectomy instead of proceeding to the radical operation. At the same time the indications are often very clear and I think the results above narrated show that they should be acted on.

A SERIES OF CASES OF DUCT PAPILLOMA OF THE BREAST

BY ELIZABETH H. LEPPER, O.B.E., M.B. LOND.
PATHOLOGIST TO THE ELIZABETH GARRETT ANDERSON HOSPITAL, LONDON

ALFREDA H. BAKER, M.D. BELF., F.R.C.S. ENG.
SURGICAL REGISTRAR AT THE HOSPITAL; AND

HELENA HARTOG, M.B. LOND.

THE comparative rarity of duct papilloma of the breast and the differences of opinion about its treatment seem to justify the publication of a series of cases. The divergent views held by continental workers as to the malignancy of the condition have been summarised by Knoflach and Urban [1] as follows: "Erdheim, Risak, and others consider these tumours to be absolutely benign, while Klose, Sbering, and others look on them as precancerous."

A study of the literature, the bibliography of which is given by Cheatle and Cutler,[2] has led us to the following conclusions:

1. It is only of recent years that the duct papilloma, a benign tumour, has been clearly distinguished from the duct carcinoma, which is a malignant one.

This has led to the belief that the papilloma is potentially malignant and the duct carcinoma relatively benign.

2. The general recognition of the frequency of multiple duct papillomata is also of recent date; statistics of cases where this possibility has been specially considered are few in number. Hæmorrhage from the nipple after local removal of one papilloma has been taken to mean a recurrence of the growth, whereas it was really due to another papilloma not detected at the operation. Hart,[3] in a series of 95 cases of duct papillomata, found multiple tumours in 37 per cent. Cutler,[4] in 11 cases, found two in which the disease was bilateral and two in which the tumours were multiple. This question of multiplicity has not been sufficiently considered by those who advocate local removal of the papilloma.

3. Some authors (e.g., Knoflach), by stressing the diagnostic value of hæmorrhagic discharge from the nipple in cases of papilloma, have created the impression that this physical sign generally indicates an innocent tumour. It is true that in any series of cases of papilloma a discharge from the nipple, generally blood-stained, is present in the greater proportion of the patients; but the converse conclusion—that a blood-stained discharge indicates papilloma—would be very misleading. The figures available show that the chances of the causative agency being innocent or malignant are about equal. Judd (quoted by Miller and Lewis [5]) in 50 cases found 54 per cent. to be carcinomata; Adair,[6] in 108 cases in which the presence of red cells in the discharge was established microscopically, found 49 carcinomata and three sarcomata.

4. The majority of duct papillomata are innocent tumours, but in any series of cases there are always some which show definite evidence of malignant change, and others which are associated with a diffuse proliferation of the epithelium of the surrounding ducts suggestive of carcinoma. More evidence is needed to guide the surgeon regarding the operation to be done.

We have for these reasons examined the material available at the Elizabeth Garrett Anderson Hospital with a view to determining the proportion of cases in which (1) multiple papillomata were present; (2) malignant growth had occurred; and (3) the histological appearances of the tissue surrounding the tumour were suggestive of malignancy.

SOURCE AND NATURE OF THE TUMOURS EXAMINED

The material has been collected during the last 20 years. Of the earlier cases we possess only the microscopic sections and the case-histories; during the last ten years the operation specimens have been preserved. These specimens have been re-examined in serial sections of about 2 mm. in thickness, cut by means of a bacon-slicer. This machine has been of great assistance in locating the papillomata, some of which had not been found by the ordinary method of incising suspected areas. The slices obtained give a very clear picture of any associated lesions and of their extent. They can be stained in bulk and cleared in alcohol and xylol to show the relations of the ducts and the glandular tissue. This is a simple modification of the method of examination by serial sections which is possible for any small laboratory. Altogether 40 specimens have been examined from 38 patients. Of these, 28 were benign, 4 were undoubted carcinomata, and 8 showed microscopic papillomata with diffuse proliferation of the epithelium of the surrounding ducts which was suggestive of malignancy.

BENIGN TUMOURS

There are 28 specimens from 26 patients; two cases have been bilateral, and we have the clinical history of 24 of these patients.

Age.—The youngest is 19 years and the oldest 64.

Tumour.—Clinical examination revealed a lump in 17 of the cases; 14 patients had been conscious of the presence of a lump for periods varying from three months to nine years, and in seven cases it was the tumour which caused the patient to seek advice.

Discharge from the nipple was present in 17 cases. Two of the patients who did not show discharge from the nipple had large blood cysts in the breast, and another had a large serous cyst, so that there was evidence of secretion from the tumour in 20 cases. The discharge was blood-stained at times in 11 cases.

Mobility.—Only in two cases was there any attachment to skin or fascia.

Operation performed.—In 23 cases a simple excision of the breast was done; in one case this was combined with removal of the axillary glands, and in another case a radical amputation was performed because the tumour was attached to skin. In one case only was the operation confined to a local excision of the tumour. This patient has failed to report since operation.

After-history.—Of the 26 patients 18 have been traced; two are recent cases and two are dead—one of tubercle, the other of an unknown cause. One patient returned 14 months after operation with a similar condition of the other breast. The remaining 13 cases are known to be well for periods varying from eight months to 11 years after the operation.

Pathological findings.—We define a duct papilloma as a tumour springing from the side of a duct and confined within its wall. Its size, shape, and position may vary, and it may have one or more attachments to the wall of the cystic space in which it lies. It is composed of a connective tissue core covered by epithelial cells. The tumours of the intracanalicular type, in which the connective tissue predominates, have not been included.

Of the 28 specimens, nine were found to show multiple papillomata, and in two patients both breasts were affected. Nineteen specimens were available for slicing; additional papillomata were found by this means in five cases. These were cases in which the most important tumours had not been detected at the original examination, although microscopic papillomata of the nipple had been demonstrated. Papillomata are not easy to feel, as they are often softer than the surrounding breast tissue. They may not be more than one-third of an inch in diameter, so that an incision may easily miss them, particularly with a fat breast and a tumour lying in a duct outside the margin of the areola. A certain amount of cystic change was found in every breast in which there was glandular tissue present; in some of the elderly patients the breast tissue was represented by thickened and dilated ducts in a mass of fatty tissue. The cysts were generally small and closely packed, the whole resembling the mesh of a sponge. In some cases the cysts were larger, varying up to one inch in diameter. The cystic portions occupied one-third to one-half or even the whole of the breast. Microscopic sections of the "spongy" breast tissue showed dilatation of the ducts, and of some of the alveoli of the lobules. In some of the recent cases, where the relations of the papilloma had not been destroyed by removal of the greater part of the papilloma for microscopic section, it is possible

to see that the "spongy" area lies in direct relation to the duct containing the papilloma, the appearance strongly suggesting that the cystic dilatation is due to the pressure of the secretion behind the papilloma. The intermittent discharge from the nipple which occurs in these cases is due, not only to the hæmorrhage which takes place at the surface of the papilloma, but also to the normal secretion occurring in the glandular tissue. Under normal conditions this escapes freely and is too scanty to be noticed, but when the exit from the duct is blocked, it causes dilatation of the duct and, later, of the alveoli, and periodically discharges at the nipple in an appreciable quantity.

TUMOURS SUGGESTING MALIGNANCY IN MICROSCOPIC APPEARANCE

In this group there were eight cases.

Age.—The youngest was aged 23 and the oldest 49.

Tumour.—This was present in seven out of the eight cases, and is generally described as a hard, irregular mass, not in such close relation to the nipple as in the previous group. The diagnosis made was usually "mastitis."

Discharge from the nipple.—This was found in two of the cases, and these two both had, in addition to the diffuse changes, papillomata visible to the naked eye.

Mobility.—No case showed any attachment to the skin or fascia.

Operation.—In four cases removal of the breast alone was done. In one case, following the pathological report, a radical amputation was performed. In three cases there was an excision of the tumour alone, the patients refusing the further operation that was advised after examination of the tumour.

After-history.—Two cases are recent, and one has not been traced. The other five are well for periods varying from four months to eleven years.

Pathological examination.—Examined by the hand lens, the area of breast affected was seen to consist of closely packed cysts, varying in size from 1 mm. to 10 mm. in diameter. Thickened ducts, apparently filled with white or yellow secretion, could be seen in the centre of the mass. In two cases, papillomata 2 cm. by 1·5 cm. in size were to be seen; these were the two cases with a history of discharge from the nipple.

Microscopic sections showed that the ducts contained multiple minute papillomata and also solid columns of proliferated epithelium. The cells stained well, but no infiltration of the walls of the ducts was found. The appearances were so similar to those seen at the edge of an intraduct carcinoma that removal of the breast was advised in every case.

MALIGNANT TUMOURS

There were four cases in this group. The patients all presented the clinical signs of carcinoma. Their ages were 37, 67, 72, and 75 years respectively; radical amputation of the breast was performed in all except the patient of 75 years. These breasts showed a papilliferous growth which was infiltrating the wall of the cyst. The microscopic sections confirm the naked-eye appearances.

THE TREATMENT OF DUCT PAPILLOMA

In the present state of our knowledge it is probably safest to advise removal of the breast in the great majority of cases. Where the clinical signs are those of malignancy, the radical operation will be performed. In other cases simple complete removal of the breast will be sufficient. We have no knowledge of the results of treatment by radiation, and are therefore discussing only the operation to be selected. The tumour caused by multiple diffuse papillomata is, in our experience, usually removed locally as a case of "mastitis." The condition having been diagnosed by frozen section or otherwise, the surgeon should proceed to removal of the whole breast.

When the clinical findings are of a discrete mobile tumour at or near the periphery of the areola, pressure on which produces secretion at the nipple, we may assume we are dealing with an intraduct papilloma. In this case we have the choice of doing a local operation, but, since at least 30 per cent. of these simple papillomata are multiple, the patient must fully understand that the symptoms may not be cured, and that a further operation may become necessary. Some patients will prefer to have the breast off at once. The local operation is planned to remove the tumour and the glandular tissue drained by the duct containing it. A radial segment of breast is removed, the apex being at the nipple and the base being about one inch wide and touching the margin of the breast. If a palpable tumour is present behind the nipple, its removal will probably interfere with the neighbouring ducts, so that excision of the breast is the right policy.

When no tumour can be found, but the history of intermittent discharge from the nipple makes the presence of a papilloma almost certain, removal of the breast should be done. Our experience of the difficulty of finding these small tumours, even on systematic slicing, makes us think that attempts to localise them by exploratory operations are not likely to meet with much success.

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RECENT ADVANCES IN THE TREATMENT OF LUPUS VULGARIS

By Evelyn M. Holmes, M.B. Manch.

DOROTHY TEMPLE CROSS RESEARCH FELLOW IN TUBERCULOSIS

(With an abstract of an article on the Construction of the Finsen-Lomholt Lamp

Finsen light treatment has long been generally acknowledged as the most useful and specific treatment for the majority of cases of lupus vulgaris. A research fellowship has given me the opportunity this year of visiting the Finsen Light Institute in Copenhagen where this treatment originated and is still in progress, and of studying the work as it is being carried out there to-day.

During the past twelve months there has been a revolution of the older methods; a new lamp has been constructed which has superseded and replaced all the older types of lamp because of its easier mechanisation, cheaper running expense, and greater biological and clinical efficiency. The general features of the lamp are described in an appendix to this paper. Its essential principles are the same as in the old Finsen and Finsen-Reyn lamps, but there is more effective filtering of the rays and the mechanisation of the control and application excludes the variable personal factor and allows a saving of staff

in time, number, and expense. One of the new lamps is in fact equal in administrative and clinical value to three of the old lamps. Each individual "treatment" is effected more speedily and more surely. A patient may have four to six treatments a day, and day after day in quick succession, until a wide area is attacked and "cured." I have seen in this way extensive lupus cleared out completely or almost completely in the course of three months; in certain cases this speeding-up has turned the scale in favour of the patient in a case otherwise apparently hopeless. Further, the result seems more permanent in the cases treated with the new lamp. Art in the treatment is more readily acquired than with the old lamp. Some striking illustrations of what the results may be have appeared in *Ugeskrift for Laeger* (1932, p. 946).

General carbon arc lamp baths are given to most patients in addition, and other treatments as necessary. Patients are never discharged as cured. According to their state they are advised to return for review in 3, 6, or 12 months' time, and if still clear to return in two years. If they do not come again within the specified time they are written for. Signs of recurrence are itching, scaling, and nodulation, felt and then seen, and in this order. Wherever there is even suspicion of disease treatment is given. The mucous membranes are always examined. Lupus in nose and throat may be treated by the lamp just as readily as the skin, special applicators being available.

As the effect of the treatment is unspecific and depends upon factors not yet wholly understood, but partly upon the depth of the skin action, it has been tried in Copenhagen, and successfully tried, in certain other conditions—e.g., certain types of lupus erythematosus with deep infiltration, cases of nævus flammeus and Boeck's sarcoid, and a few resistant cases of eczema. Differential diagnosis is not always easy. Confusion may occur with lupus erythematosus, rosacea cumacne, Boeck's sarcoid, syphilis, and occasionally with other conditions. One of the most useful points in differential diagnosis is the consistency of the nodule; a lupus nodule is readily pierced by a probe.

Other treatments than light are of occasional value in lupus work, but for the most part light alone, general plus local, will cure. General light alone will not cure, though arrest may occur. Infra-red photography has been tried in Copenhagen, but has not yet proved its value.

I wish to thank Prof. Axel Reyn, president of the institute, and Dr. Lomholt, chief of the dermatological department, for allowing me facilities for detailed study over a period of three months.

THE FINSEN-LOMHOLT LAMP

(Abstract of an article on the lamp construction by Dr. Svend Lomholt)

THIS lamp was constructed to replace the original Finsen apparatus and the Finsen-Reyn lamp. Like these two, it is designed for the local treatment of skin lesions and especially the various forms of skin tuberculosis with concentrated carbon arc light.

The construction of the lamp is based on the observation that the therapeutic effect of this treatment depends almost entirely upon the ultra-violet rays. By using a double colour filter it was found possible to absorb not only the dark heat rays but also the luminous rays, with the exception of some of the violet rays, without reducing the effective ultra-violet rays by more than about 20 per cent. By passing the carbon arc light through this filter, a mixture of rays is obtained very rich in ultra-violet energy (about 75 per cent.), whereas the energy with the old apparatus does not amount to more than about 15 per cent. of the total radiation energy. In this way it is possible to carry out a much more intensive irradiation of the skin without the risk of burns from the heat rays.

The required increase of the radiation intensity is obtained by placing the light source, the positive crater of the arc light, considerably nearer the concentration apparatus. In this new lamp the concentration lenses consist of the perfectly thermo-resistant fused silica, instead of the lenses of the brittle natural quartz as employed previously. Thus it has been found possible to reduce the distance between the crater and the front lens from about 100 mm. to 45 mm.

The construction of the lamp was improved by a firm attachment of the carbons, and by connecting the carbon arc with the concentration and compression apparatus. Thus it was found possible to obtain a firm adjustment of these three parts so that the handling of the apparatus was simplified. The great increase of the radiation intensity permits cutting the radiation time down to about half the time required with the old apparatus.

Clinical and Laboratory Notes

SUDDEN DEATH FROM PANCREATIC HÆMORRHAGE

BY A. R. D. ADAMS, M.D. LIVERP., D.T.M.
PATHOLOGIST, MAURITIUS; AND
F. BOULOUX, M.R.C.S. ENG.
GOVERNMENT MEDICAL OFFICER, MAURITIUS

HÆMORRHAGE into the substance of the pancreas is sufficiently rare, and may be of so much medico-legal interest, as to warrant a report of the following case in Mauritius.

An Indian, aged 20, was performing his usual manual work as labourer on a sugar estate on March 11th, 1933. He was in apparently perfect health, and was a well-nourished man of the usual physique of his race. On March 12th fell an Indian religious festival in which he took part. His share in the proceedings consisted of singing and dancing all day with a party visiting sundry houses, at many of which the performers were regaled with rum. No solid food was taken during the day. At 7 P.M. he, together with four compatriots, had a drink of rum at a house, and a few minutes later complained of acute pain in the abdomen. He was assisted to a neighbouring Indian temple and placed on a couch, where he collapsed and died within 20 minutes. Poisoning was immediately suspected and the usual steps taken, but the other four men who partook of rum from the same bottle suffered no ill-effects other than those due to their libations during the course of the day.

A *post-mortem examination* was made 24 hours after death at the request of the police. On opening the abdomen nothing superficially abnormal was noted. The chest was next opened, but no gross lesions were detected. The œsophagus was dissected away and ligated at the cardiac end of the stomach; on attempting to ligate the pyloric end of this organ a large blood clot was noticed in the duodenal curve, which proved to arise from hæmorrhage in the pancreatic region, the hæmorrhage being localised to that organ and its immediately surrounding tissues.

The pancreas was carefully examined and was found distended with blood clot; no evidence of suppurative

inflammation, gangrene, or antemortem necrosis of the organ could be discerned with the naked eye. Closer examination of the abdomen failed to reveal the presence of free fluid in the peritoneum or of pathological lesions of the small intestine or other abdominal viscera; no evidence of neighbouring fat necrosis due to the action of liberated ferments could be found. The stomach and œsophagus smelt strongly of rum, and no solid food residue was found in the former. The liver, kidneys, lungs, heart, brain, and other organs appeared normal. On section the pancreas was found to be infiltrated with blood, more particularly towards the head, and a large clot was found exuding from a small rupture on the anterior surface of the organ in this region. Microscopical examination of sections revealed a limited area of necrosis in the neighbourhood of the rupture, and it appears that there had been a lesion in that region for some time before death. No obvious cause for a localised ischæmia could be found.

Death was certified as being due to natural causes, in the form of the so-called acute hæmorrhagic pancreatitis. The apparently complete lack of symptoms until less than half an hour before death is of note; earlier immediate symptoms may have been obscured by the semi-intoxicated condition of the subject, coupled with the religious fervour under which he was labouring at the time. This case, in its history and post-mortem findings, closely resembles that described by Maconie [1] from Shanghai, in which death occurred even sooner after the onset of acute symptoms.

A CASE OF CHOREA TREATED WITH EVIPAN SODIUM

By Gerald Slot, M.D., M.R.C.P. Lond., D.P.H.
PHYSICIAN, ROYAL WATERLOO HOSPITAL; CONSULTING PÆDIATRICIAN, LONDON COUNTY COUNCIL HOSPITAL SERVICES; AND
R. S. McDade, M.B. Camb.
HOUSE PHYSICIAN TO THE ROYAL WATERLOO HOSPITAL

A boy, aged 9, was admitted to hospital on August 22nd, 1933. There was a history of twitchings of both arms, both legs, right side of face and body for two weeks, but no history of rheumatism in any form. The tonsils had been removed one year previously.

On admission the child was pale, ill-nourished, and very nervous; he had typical choreiform movements of face, arms, trunk, and limbs, even at rest, more marked on the right side of the body than on the left. The heart was quite clear. No other rheumatic manifestations were present. The throat was a little red. The tonsils had previously been removed.

The child was put in a cot next to the partition and screened off. He was given a full diet, with halibut-liver oil and malt, three times daily, and a mixture containing arsenic, iron, and calcium lactophosphate three times daily. The throat was painted with Mandl's paint. After two days, however, the condition was exactly the same as on admission. The movements were present nearly all the time the child was awake; he was still extremely nervous and he did not sleep well. The only apparent change was in the throat, the redness of which had disappeared.

On August 24th he was given 1 c.cm. of Evipan sodium by the intravenous route. The injection was given slowly, and by the time 1 c.cm. had been given he was asleep.

After about half an hour he woke up but remained quiet without any convulsions for the rest of the day. He also slept better that night. The following day the twitchings were again present but not so frequent or so severe as before his injection. On August 26th the twitchings were again very severe and his restlessness had returned. He was given another injection of 1 c.cm. with results similar to those following the first injection. On this occasion, however, the effect appeared to be more prolonged—that is to say, although he slept for only half an hour his symptoms were definitely improved for three days instead of two.

After three days, that is, on August 29th, it became necessary to transfer him to another ward. Here he was again put in a corner cot and screened off, but his symptoms returned and on Sept. 3rd another 1 c.cm. of evipan was given. Although the immediate effects of this injection were similar to the two previous ones, his symptoms when they returned were very much less severe. He got no choreiform movements at all while he was at rest, although they were present as before on movement. He was also much less restless, and it was found possible to remove the screens for a gradually increasing period each day without causing any restlessness, excitability, or exacerbation of the symptoms.

On Sept. 9th he had to be transferred back again to the ward from which he had originally come, and the change caused a very definite exacerbation of the symptoms, upsetting him more than might have been expected. The evipan was repeated on Sept. 11th, 2 c.cm. being given on this occasion. This injection was given about two hours before he was in the habit of going to sleep for the night. He immediately went off into a perfectly natural sleep from which he did not awake until the following morning. During the four following days he was very much better. There were no twitchings of his face, body, or legs, but choreiform movements were perceptible when the hands were extended.

On Sept. 16th 2·5 c.cm. of evipan were given. Since that day there have been no choreiform movements at all. He can protrude his tongue and bring it back slowly into his mouth. He has not been at all restless, and he talks and plays with the other children without getting excited. His pulse-rate throughout has remained between 80 and 90 per minute, except on one or two occasions when it has gone up to 100. He is now perfectly quiet.

It is realised, of course, that many cases of chorea with no treatment other than rest in bed might improve in three or four weeks; this, however, was a severe case, and one moreover in which a preliminary period of rest caused no improvement. It suggests that evipan can be used harmlessly in small doses in children, and that it has a definite value in checking the tremors of chorea. The remedy is being tried in other cases.

[1] Maconie, A. C.: Brit. Med. Jour., 1926, ii., 638.

Unauthorised Hospital Collections.—King Edward's Fund has issued a warning to London hospitals against schemes for the collection of "waste." "Investigation has shown," says the circular, "that some of these schemes are primarily run for private profit." It is suggested that, for the protection both of the hospitals and of the public, special care is at present needed to avoid any action by hospitals which could be represented as authorising the use of their names, unless they are satisfied of the bona fides of the applicant or his society. The Charity Organisation Society states that it has investigated 15 such schemes without finding one of which it could say "this is a genuine attempt to help charity, and we can recommend it."

Radcliffe Infirmary, Oxford.—The report for 1932 states that over 1000 applications were received for training as nurses, as compared with 319 in the previous year. The extensions which came into use during the year included the new nurses' home, two theatres, a surgical ward for women and two for men. A new X ray department is being built, and an existing building is being converted into an isolation ward. The receipts from the weekly contribution scheme exceeded £37,000. A small block of six rooms has been erected for paying patients, in addition to six single rooms in the maternity department, and a further block of 16 rooms is to be provided for paying patients in connexion with the main hospital. There were 3492 patients treated to a conclusion in the infirmary, which had just under 10,000 new out-patients. The total income was £50,856, and the bank overdraft is £8666.

MEDICAL SOCIETIES

TUBERCULOSIS ASSOCIATION

THE subject chosen for the conference held in London from Oct. 26th to 28th was the diagnosis, treatment, and prognosis of

Cavities in Pulmonary Tuberculosis

Dr. JANE WALKER presided, and Dr. W. BURTON WOOD (Victoria Park) opened the discussion. The question he had been set to answer was: Do annular shadows represent air spaces in the lungs? To this there could be only one answer: they did. There were several points in proof of this assertion. (1) Annular shadows were peculiar to pulmonary tuberculosis, which was the great cavitary disease. (2) These round shadows were closely associated with tubercle bacilli in the sputum. When they were seen in the X ray photograph, in at least nine cases out of ten, tubercle bacilli were present in the expectoration; and conversely, when the cavity was no longer patent the bacilli disappeared at almost the same time. (3) A cavity of this type might break down again with tubercle bacilli in the sputum. (4) The shadows were not annular but spherical, as could easily be seen by moving the position of the patient. (5) Annular shadows on healing left a permanent scarring on the lung. During A.P. treatment the cavities contracted concentrically. (6) Though direct pathological evidence was lacking, indirect evidence was supplied by a study of the thickened wall cavity. They could fairly assume that soft exudative diseases were associated with soft-walled cavity. Soft-walled or annular cavities being characteristic of early disease, they could not be found on post-mortem examination of patients dying from pulmonary tuberculosis.

Dr. J. V. SPARKS (Victoria Park) said he had been asked to answer certain questions in relation to annular shadows. First: "Are annular shadows air spaces?" To this the answer was Yes, but with the qualification that although every annular shadow seen radiographically contained air within it, such air-containing space was not necessarily due to true cavity formation. Annular shadows were sometimes seen in emphysema, where they were formed by emphysematous bullæ; also in bronchiectasis, where they were formed by localised dilatation of the bronchi; also in tuberculosis, abscess, and some forms of pulmonary neoplasm where an air space was caused by destruction or absence of lung tissue. Therefore in answer to the second question: "Are there two varieties of cavities?" he would reply that there were many. Question three was: "What are the differences in the varieties of cavity formation?" In the case of tuberculous cavities, the differences in appearance were (*a*) in regard to size and shape, and (*b*) in the degree and type of changes in the adjacent lung. If there was no infiltration in the surrounding lung, the cavity would present a dense irregular margin, the density of its centre possibly not differing in degree from the surrounding lung field. If the cavity was surrounded by solid lung, it would be seen as a clear-cut area of translucency; if it reached the costal margin there would be evidence of a pleural reaction. Cavities might be easily recognised when they were wholly in the lung field, but were liable to be overlooked when they were paravertebral, near the hilum, posterior to the heart, or below the level of the domes. Annular shadows in the hilar region were sometimes mistaken for cavities when they were really due to shadows produced by a conglomeration of bifurcating bronchi. Apart from oblique, lateral, tangential, and stereoscopic views, the chief methods of examination which they had at their disposal were: (1) subsequent examination after an interval, and (2) diagnostic pneumothorax; both of these were of great value. It was, he thought, unusual for lipiodol to enter an annular shadow when injected via the trachea.

Dr. G. T. HEBERT (St. Thomas's) showed a diagrammatic representation of the four types of cavity, on the analogy of the solar spectrum. At one end was the fibrotic cavity, which was more or less round, with smooth walls, and at the other end a thin line of necrosis representing the annular shadow. Between these were the indurated necrotic type, which came next to the fibrotic, and thirdly the recent necrotic. There were, however, many intermediate gradations. With regard to the need for treatment, the fibrotic type at one end and the annular shadow cavity at the other probably did not need it; the two intermediate types did. Although necrosis was the main factor in cavity formation, other possible factors influencing the X ray picture were inflation, elasticity of the lung, and patency of bronchus.

Dr. ANDREW MORLAND (Mundesley) discussed the criteria for differentiating cavities from annular shadows. Ordinary cavities resulted from breaking down and evacuation of caseous infiltration; this being an indication of a high degree of allergy and poor defence, toxic symptoms in some form were invariably present. An early cavity could not be diagnosed by physical signs, but X rays showed the gradual appearance of less opaque areas in the substance of dense infiltration, these areas tending to coalesce. In shape the cavity tended to take up that of the original patch of infiltration, but frequently enlarged beyond it. When annular shadows first appeared in the case of patients undergoing sanatorium treatment, some change for the worse was observed in the general health. Physical signs were absent. These round cavities were mostly associated with early disease, being rare in fibrotic cases. A typical feature was their rapid appearance often followed by an equally rapid disappearance and sometimes reappearance. Although a few persisted and turned into chronic fibrotic cavities, the majority disappeared, leaving only a small scar. In cavity formation two factors were at work: destruction and infiltration, sometimes one predominating and sometimes the other. A purely destructive cavity hollowed out a caseated portion of lung tissue and assumed the same shape as the previous infiltration. A round cavity (annular shadow) was much larger than the pre-existing infiltration, and underwent rapid fluctuation in size; but a slight degree of caseous infiltration was likely to be present in the wall which might result in a chronic cavity.

Dr. S. R. GLOYNE (Victoria Park) then showed a series of lantern slides illustrating walls of soft cavities. The pictures were made from histological sections by assembling camera lucida drawings of adjacent portions of sections to build up the cavity wall. The slides showed respiratory bronchioles, capillaries, small extravasations of blood, caseous nodules, and strands of elastic tissue in the wall, but practically no connective tissue. A control illustration was also shown, illustrating the thick connective tissue wall of an old cavity.

A discussion followed. Dr. A. NIVEN ROBERTSON (Chesterfield), who showed several slides of annular

shadows to illustrate his points, said that he could not believe that all annular shadows were cavities. He thought that X rays had made the diagnosis of cavities more difficult. If it was true that annular shadows were soft cavities and yet gave no physical signs, why should fibrotic walls produce physical signs?—Dr. R. A. YOUNG said he also had not been convinced, by the arguments and photographs shown, that annular shadows always represented cavities; he still had an open mind on the subject. Mr. H. P. NELSON thought that stereoscopic films would always show whether or not a true cavity was present.—Dr. R. R. TRAIL (Midhurst) supported Dr. Young, saying that annular shadows often came and went without any physical signs or symptoms, and that after artificial pneumothorax any cavity would be shown up in greater detail than before.

TREATMENT

Dr. W. C. FOWLER (Pinewood) based his conclusions upon some 1500 tuberculous cavity cases amongst over 4000 young adult patients. In the *acute cavity*, usually associated with pyrexia and severe toxæmia, an immediate attempt should be made to produce an artificial pneumothorax, without which the chance of recovery was less than 1 in 10. With an A.P. recovery occurred in 1 in 3 cases in the speaker's experience—recovery here meaning good health for five years. Although the immediate result of A.P. might be admirable and often dramatic, there was always a danger of a flare-up in the other lung, and a course of Sanocrysin with complete bed-rest, concurrently with the A.P., appeared to give the best results. A phrenic evulsion was often desirable before allowing the patient to give up refills. The *fibrocaseous cavity* presented a wide variation in its requirements for successful treatment, but, generally speaking, the results of sanatorium treatment of such cavities without intervention were not good, no less than 60 to 80 per cent. of the patients being dead at the end of five years whenever the cavity was of any appreciable size. In the rare cases in which the cavity occurred at the extreme apex, the lower lobe not being involved, the cavity could generally be left alone. For fibrocaseous cavities just below the clavicle, the speaker's practice was to give six weeks' sanatorium treatment in bed, with careful sputum and temperature charts, after which if there was no appreciable diminution in sputum or improvement in temperature or blood sedimentation-rate, the right course was to attempt some form of collapse. If adhesions were holding up a cavity at the end of six to eight weeks, thoracoscopy should be resorted to, by which means the really hopeless cases could be quickly ascertained and other measures, such as partial or complete thoracoplasty or an apicolysis, adopted without loss of valuable time. An uncollapsed thin-walled cavity which was suspended by one or more adhesions was a very dangerous condition, and if the adhesions could not be quickly and completely divided, the A.P. ought not to be left to drift on. If the cavity was in the upper half of the lung and the lower half was reasonably free from disease, the best course was to allow the A.P. to become absorbed and to do an upper thoracoplasty, preferably without a phrenic evulsion. If the lower half of the lung was definitely involved, it was better to keep the A.P. going and continue refills after an upper thoracoplasty. In the case of *fibroid cavities* with really thick walls, collapse by A.P. was difficult, if not impossible, even if no adhesions were present. When such cavities gave rise to no symptoms they could usually be safely left alone. When interference was necessary, apicolysis or thoracoplasty was needed; an inadequate thoracoplasty might however be worse than none at all. The value of phrenic evulsion lay, he thought, in its effect upon the surrounding lung tissue rather than on the cavity itself, except in the case of very recent soft-walled cavities in the base. He had been impressed with its value after the collapse of a cavity by A.P., before the lung was allowed to re-expand. He doubted, however, whether a cavity was ever really obliterated.

Dr. JAMES WATT (King George V.) said he had examined the records of 899 consecutive cases treated without collapse therapy during 1926 and part of 1927 in the King George V. Sanatorium. In 109 of these there was evidence of cavitation detected on ordinary physical examination. Excluding cases who could not be traced at the end of five years, of the cavity cases 82 per cent. were dead, 11 per cent. alive and fit for work, and 7 per cent. alive but unfit for work, the corresponding figures for the non-cavity cases being 49, 38, and 13 per cent., respectively. Serial radiograms in 50 of the cavity cases were studied to estimate the effect of sanatorium treatment without collapse therapy on the size of the cavities, where a reasonable period of time elapsed, ranging from 7 to 50 weeks and averaging 20 weeks, between the taking of the first and last films. In 50 per cent. the cavities were unchanged in size, in 34 per cent. they increased, in 10 per cent. they grew smaller, and in 6 per cent. they varied in size. These figures were disconcerting to the view formerly held that cavities would frequently shrink during sanatorium treatment. Although such treatment without collapse therapy did effect an improvement in the general condition of patients with pulmonary cavities, it had little effect in obliterating definite pulmonary cavities 1 cm. or more in diameter. The ultimate prognosis in such cases was definitely bad.

PROGNOSIS

Dr. L. S. T. BURRELL (Brompton) said that treatment depended entirely upon the type of cavity present, which might be: (1) the recent cavity without a wall of fibrous tissue; (2) the cavity containing pus and lined with a fibrotic wall; (3) the dry cavity lined with a fibrotic wall; (4) the cavity diagnosed by X ray alone, with no other signs or symptoms. In the case of (1) the speaker thought it absolutely essential to collapse the cavity by artificial pneumothorax, since otherwise the disease would spread rapidly, the other lung soon becoming affected and the patient usually dying within a year or eighteen months. Phrenic evulsion was useless and often actually harmful, and thoracoplasty was definitely contra-indicated. In some of these acute cases the disease might progress without cavity formation, yet artificial pneumothorax was just as urgently needed. In type (2), which was by no means uncommon, treatment should be directed to closing the cavity, if possible by artificial pneumothorax, for an enormous majority of patients with such a cavity did not long survive; they were exposed to many dangers, such as secondary infection, hæmoptysis, and recurrent temperatures, and their general health was usually much impaired. If artificial pneumothorax failed to close the cavity, by reason of adhesions or otherwise, some other method must be found, such as thoracoplasty or apicolysis. Phrenic evulsion alone was, in the speaker's experience, disappointing. In type (3) the possibilities of danger from the cavity should be weighed against those from attempts to collapse it. Symptoms due to the cavity, such as recurrent hæmoptysis or pyrexia, might justify even

drastic treatment, but it was important to distinguish between symptoms due to the cavity and those that were not. The more fibrosis, the less likely was artificial pneumothorax to be successful, and apicolysis or thoracoplasty was usually needed to collapse the cavity. But except in the presence of definite indications for interference, a chronic fibroid case was often best left alone. Finally, the cavity only revealed by X rays should not be taken as an indication for collapsing the lung.

Dr. B. R. CLARKE (Belfast) thought there was abundant evidence that the natural healing of cavities was much commoner in the early forms. Annular shadows, especially when unaccompanied by definite physical signs of a cavity, often disappeared with prolonged rest. With thick-walled cavities the degree and probability of healing were in proportion to the power of the lung to contract. Flattening of the chest wall and displacement of the mediastinum formed part of the healing process, which was necessarily slow. The size of a cavity had some bearing on prognosis; some authors described as cavities small ill-defined areas of rarefaction half an inch in diameter. All the radiological cavities dealt with in his own figures were more than this in diameter and the majority more than one inch. He thought it questionable whether hæmoptysis was especially associated with cavity formation. Jacquerod held the contrary, and had quoted impressive figures in support. The clinical histories of patients in the Forster Green Hospital amply bore out this view, although the difference was somewhat less marked than in Jacquerod's figures. Aspiration of infected matter was a very real danger, the contents of a cavity passing into previously unaffected areas of the same lung and of the other lung. Certain of the extra-pulmonary complications of phthisis were also common in cavity cases—e.g., tuberculosis of the larynx. The influence of pleural adhesions on cavity formation had been studied by the Matsons, who found that satisfactory collapse of the lung by A.P. was prevented by adhesions in 60 per cent. of cavity cases as compared with 49 per cent. in fibrocaseous cases without cavity. The mortality from pulmonary tuberculosis in patients with positive sputum was very high where conservative treatment only had been adopted; it might be doubted whether a cavity could make the prognosis much worse. There was, however, direct evidence that the immediate mortality was greater in patients with a cavity.

Dr. G. E. SOLTAU (East Anglia) said that in no other disease were there so many pleasurable surprises and so many disappointments over relapse. The unknown factor was the fibrosing faculty of the individual. Cavity formation in the lung was a result of the infection, and the three forms of cavities described were really the result of the patient's reaction to the disease. In the intensely acute case with rapid cavity formation with a necrotic wall, the patient's reaction was practically nil—there was no fibrosing faculty from the outset—and the prognosis in these cases was grave as regarded arrest or cure. It was, she felt, a mistake to treat the cavities as such at that stage, especially when there was marked toxæmia. The patients should first have a period of absolute rest, for though dramatic results might be obtained for a short period by collapsing the lung, the improvement would not be lasting, and there was a risk of extension to the pleura with empyema or a visceral lesion. If rest definitely improved the condition, the cavities might be treated, although without much hope. In a fibrous-walled cavity compression of the lung obliterated the lumen and prevented secretion from collecting. Here again the fibrosing faculty of the individual was the determining factor. The healing of cavities even when compressed was often very slow. Until some method could be found of stimulating fibrosis, cavity formation of either type must have a doubtful outlook. With the dry fibrotic cavity, there was no occasion for any local treatment.

THE MEDICO-LEGAL SOCIETY

AT a meeting of this society held on Oct. 26th, Sir BERNARD SPILSBURY, the new president, gave an address on

Some Medico-Legal Aspects of Shock

He had selected this subject, he said, because shock might occur in forms which present to the medical man most difficult problems for elucidation. In such forms the sudden death offered little opportunity of observing the bodily changes which had taken place, or of ascertaining the mechanism by which death was brought about. "Shock" he regarded as one of the most overworked terms in the medico-legal vocabulary, as many deaths said to be due to shock should really be ascribed to such conditions as loss of blood, exhaustion, injury to a vital organ, or concussion of the brain, and so forth. Cases in which persons could justly be said to owe their death to shock were comparatively rare. It was an elusive term to define. Shock might develop gradually, appearing some hours after the injury which caused it; its most striking manifestation was a progressive fall of blood pressure to a level far lower than was found in health, and this might continue to a fatal issue. But the fall might be arrested and recovery ensue. Of this variety of delayed shock many examples were encountered in the war, and some of the deaths following street accidents came into the same category. Deaths due to flagellation might be similarly classified. He referred to this form of shock to point out the mechanism by which it developed, as the investigation of war injuries had shown that the progressive fall of blood pressure was due to changes occurring mainly in the capillary circulation, those tiny vessels becoming greatly dilated, and so accommodating far more blood than usual; and in addition, as a result of changes in their walls, some of the fluid of the blood passed into the tissues and so the total volume in the vessels was materially reduced. Experimental work had demonstrated that the explanation of these changes was that the crushed and injured tissues gradually developed certain chemical bodies known as histamines, which, by their action on the capillaries, produced these changes.

On the other hand, shock sometimes appeared immediately after the application of a stimulus, and death might ensue in two or three minutes. In those cases opportunity was seldom given to note the bodily changes, and these forms of shock could not be reproduced experimentally in animals. Hence it was not surprising that there should be a disparity of views as to cause of death. By some it was ascribed, without qualification, to "syncope"—whatever that might mean—while others said death was due to a sudden inhibition of vital activities in the nervous system; by others abnormal reflexes were invoked. The study of this subject had received an immense impetus from the publications of the eminent French medical jurist Brouardel. Some critics expressed the opinion that such cases as Brouardel described were explained by the Gallic temperament, a view Sir Bernard did not support.

In a very important form of shock, that due to electrocution, the effects of an electrical discharge through the body had been established by experimental methods and he did not propose to consider that form.

SHOCK CAUSED BY ABORTION

A form of shock of very great importance was that due to attempts to bring about criminal abortion. Cases such as these were apparently unknown in this country until about twenty years ago, but since then their numbers had shown a steady increase. In the last 19 years he had himself investigated 19 fatalities which were ascribed to such attempts; and there was one other case in which the facts were not investigated by him, but were submitted to him for the purpose of giving evidence when a man was charged with having caused death. In 12 of the 19 cases the death followed operation by the woman on herself; in 6 the operation was done by another person, and in 5 of these the operators were convicted for procuring abortion; whilst in the other case the man, who almost certainly had brought about abortion, could only be convicted of supplying a noxious substance. One case was a doubtful one, there being grave suspicion that abortion was performed by another person. Of the 19 cases, 13 were due to the injection of fluid into the uterus; the remainder, with one exception, were caused by the passage or attempted passage of an instrument through the cervical canal. The exception he would refer to presently.

Sir Bernard described in some detail three representative cases, from which he had learned more concerning the mechanism of the death than from any of the others. The first of the three was clearly a self-induced operation. It was a death from shock due to injection of soap solution by a Higginson's syringe into the uterus.

Immediately on being called in, the police took photographs of the dead woman and the surroundings, and an enlargement of one of these was passed round. It showed the apparatus which had been used lying near the girl who was on a bed, with her clothing raised. The girl was 18 years of age and engaged to be married. On the night of her death she was alone in the house from 6.50 onwards. Nothing was known of what happened until 8.30 when, according to his custom, her young man called; he found the lights and the wireless on, and after waiting a little called her name with no response. On entering her room he gave the alarm to a neighbour, and a doctor was sent for, who, on arrival, pronounced life extinct. Sir Bernard Spilsbury deduced from the position and condition of the utensils that probably the first attempt at injection into the uterus failed, a subsequent attempt being successful. She had just time to raise herself when shock developed and she fell back on the bed, and in this posture was found. This assumption as to what had happened was confirmed post mortem. She was four to five months pregnant, and the neck of the uterus was slightly dilated, the plug of mucus in the cervix was displaced and was blood-stained, and on opening the body of the uterus it was found to have an intact ovum, the membranes being unruptured. The membranes, however, had been stripped from the lower part of the uterus for 2½ to 3 inches; in the space there was blood-stained fluid; the stripping had occurred shortly before she died, as a result of the injection of the fluid. The examination also showed that she was perfectly healthy. But there were other changes present which were of importance. When the body was first seen there was a very marked livid colour on part of the exposed skin surface, especially on the face, neck, shoulders, and upper part of the chest. By the time the autopsy was made, the intensity of the colour had abated. The transitory character of this lividity was important to remember. The organs, especially the abdominal ones, were much congested, with the exception of the heart, which was pale, and the brain. There was no injury of the genital tract.

In the second case the attempt was made by another person. This victim was a young unmarried woman 18 years of age, who became pregnant and who learned that in her village was a Frenchman who would operate upon her and who was subsequently convicted of having caused her death. She and her lover visited the Frenchman's house. She related afterwards that he had syringed her, but caused her no pain or ill-effects. He told her he had inserted a rubber tube, which, he said, would have to be removed next day, and made an appointment in the open air for the purpose. When they met the young man was required to stay some distance away and to rejoin the other two in five minutes' time. Before the five minutes had expired the abortionist shouted that the girl had fainted. The young man found the girl unconscious, and she took her last breath as he reached her. He afterwards stated that as soon as he saw her he was struck by the deep blue colour of her skin, as if she were blue with cold, though it was warm weather. The Frenchman left them, ostensibly to fetch a doctor, but did not do so, and afterwards denied all knowledge of the girl. This girl, like the last, was quite healthy, except that she showed some signs of what was sometimes described as status lymphaticus, and therefore Sir Bernard held that this might have been a factor in causing her death. But it was not an essential factor, and was not present in any of the other cases. This girl was five months' pregnant, and he found the neck of the uterus dilated uniformly to about the size required to admit a No. 9 or No. 10 catheter. When the body of the uterus was opened the ovum was found to be intact, but the membranes were separated from the wall round the internal os for a short distance, the space being occupied by a flat blood clot the diameter of a shilling, showing that something had filled the dilated cervix and had prevented the escape of blood. It was never discovered what object was used for the purpose. There had been no pain when the object was inserted and its removal could scarcely have been painful; hence pain was not the cause of the shock. An important point was that the girl was still breathing when her young man first reached her; thus her respiration continued for some time, probably about half a minute, after shock set in.

In the third case the heart continued to beat for some time after the woman became unconscious from shock. The victim was a married woman, aged 26, who died suddenly in the bedroom of a friend's house. The case was reported to the coroner, and appeared to be a sudden death from natural causes. The woman was said to have gone to the friend's house to borrow some vinegar for her husband's supper; she went upstairs to her friend who was making the bed, when she suddenly said "Oh, my heart!" changed colour, and collapsed on the floor and died at once. At the autopsy Sir Bernard found some surface lividity. She was about three months pregnant. Search of the body failed to reveal any disease which could have caused death; all the organs of the body were very congested, and the uterus was very livid. There had been no disturbance inside the uterus; the external os just admitted the little finger; there was no injury and no sign of any injection. Sir Bernard reported to the coroner, Mr. Ingleby Oddie, that the death was due to shock during an attempt to procure abortion. An inquest was held, and the witnesses adhered to their story, the coroner giving a verdict of death from shock, and observing that the police would no doubt continue their inquiries. That evening the friend in whose house the death occurred and her husband went to the police and admitted that their evidence was false and that the death was due to an attempt to procure abortion by another woman who had come to the house by appointment. This woman had previously operated successfully upon the friend, who had miscarried as the result, and at the present time the woman was treating her for another pregnancy. The deceased woman had been operated upon by the abortionist about a fortnight before her death but without effect; she was therefore familiar with the treatment. On the second occasion she was laughing and joking as she prepared for the operation. The abortionist filled a Higginson's syringe with warm water, introduced the nozzle and after adjusting it, squeezed the bulb. Immediately the woman gave a gasp, changed colour, and

lost consciousness. The abortionist fetched cold water and sprinkled it on her face. The friend's husband was then called upstairs; he helped to lift her on the bed; he stated that he could feel the heart beating. But she showed no other sign of life and was pronounced to be dead by the doctor who came a few minutes later. The abortionist, the friend and the dead woman's husband were charged as principal and accessories with causing her death, and they all pleaded guilty to the charges.

In summarising his experience of abortion cases Sir Bernard pointed out that in every one of the 18 cases the victim was young and healthy (with the exception of status lymphaticus in one case); in every case the onset was immediate and death rapid; in every case the exciting cause was some interference with the uterus, and pain did not appear to be an essential factor, as it was probably absent in the last two cases described. There was a tendency towards lividity of those parts of the surface which were not pressed upon by clothing, most marked immediately after death, fading and in some cases absent when the post-mortem examination was made. In every case there was marked congestion of most of the organs, especially those of the abdomen and pelvis, for which there was no obvious explanation; the fœtus in every case was very livid. Histamine poisoning could not be the explanation of these deaths, the immediate reaction and the absence of injury ruling out that mechanism. The constant post-mortem appearances indicated that the mode of death was the same in all the cases. As the heart was known to have continued to beat for some time in one of the cases seen before death, and the respiration was known to have continued in the other, inhibition implying an instant arrest of all the vital functions could not be the explanation. In his opinion the deaths must be ascribed to a nervous reaction of the nature of a reflex. The changes observed at the time of death and the post-mortem appearances were explained if, as the result of impulses passing from the uterus to the nervous system, a paralysis of the vasomotor junction brought about a dilatation of the arterioles throughout the body. This would lead to a rapid fall of arterial pressure, resulting quickly in loss of consciousness, the heart continuing to pump blood until it failed from slowing of the circulation and the respiration ceasing from the same cause, a much larger proportion than usual of the blood being accommodated in the dilated capillaries. This seemed to Sir Bernard the only satisfactory explanation of these deaths, but it offered little hope of treating successfully this form of shock, even if skilled attention was available immediately.

This form of shock was not, however, always fatal. Abortionists after conviction had admitted that their patients were sometimes taken ill at the time of the operation, even to the extent of fainting, and often had to rest for a time after an operation. Anæsthetists also had similar experiences, patients having uterine operations manifesting alarming symptoms occasionally when the cervix was being dilated under an anæsthetic.

SHOCK FROM LARYNGEAL STIMULATION, IMMERSION, AND BLOWS

Another form of fatal shock was due to the entrance into the larynx of a foreign body. Sir Bernard referred to two cases, in one of which a child 3 years of age, at tea with her parents, suddenly made a choking noise, coughed, fell off her chair unconscious, and apparently died at once. At autopsy nothing was found to account for her death, and the foreign body, if there was one, had been expelled. In the other case an infant of 8 months was found dead as the result of a feather entering the larynx. The sudden deaths described as occurring occasionally in garrotting were probably due to a similar mechanism. Another form of sudden death from shock which was fairly common was due to immersion in water. It was well known that bodies removed from the water not infrequently showed no signs of death from drowning and no other unnatural or natural condition which would account for death. These cases were described as deaths from the shock of immersion in water, and Sir Bernard described a typical case in which instantaneous rigor mortis also occurred; he pointed out that respiration must be arrested instantly otherwise some indications of drowning would be found. He suggested that these deaths were due to the sudden rush of water up the nose and said that he knew of no case where the victim had dived into the water. He also quoted the experience of the pearl-divers of the Persian Gulf who to this day wear no diving dress but take the precaution of placing a clip upon the nostrils before they are lowered into the sea. In these cases and in those of laryngeal stimulation there was an absence of the surface lividity and of the congestion of the organs seen in the abortion cases, and the mechanism of shock in these cases, whilst clearly nervous in character, differed from the abortions in not being associated with vasomotor paralysis but with instant paralysis of the respiratory centres; and he considered it probable that these deaths were due to some abnormality in the reflexes by which coughing and sneezing were produced by stimulation of the laryngeal and nasal mucous membranes.

Lastly he referred to the form of sudden death which occasionally followed a blow in the upper part of the abdomen, and described a recent case in a boy who was sparring with another, in the course of which he received such a blow, which caused him to collapse, lose consciousness, and die almost immediately. In this and in other cases of the kind there was found usually marked engorgement of the abdominal viscera and there might be some surface lividity, and he considered that these deaths were probably due to the effect of the blow upon the abdominal sympathetic system producing dilatation of the arterioles similar to that in the abortion cases but limited to the abdominal region.

Thus in the types of shock which he had described in which death followed almost immediately upon the stimulus, the effects were in his opinion to be attributed to a nervous reaction which depended for its form upon the site of stimulation, so that stimulation of the cervix differed in its effects from that of the larynx, these differences probably depending upon the nature of the reflexes which were normal to the particular regions.

NORTH STAFFORDSHIRE HOSPITALS.—Sir Holburt Waring, P.R.C.S., recently opened a private patients' department, which has cost £17,000, at the North Staffordshire Royal Infirmary, Stoke-on-Trent. There are 13 beds for men and 20 for women, arranged as private single and double rooms and cubicles. The cubicle wards are subdivided by glazed metal screens and curtains into two- and four-bed compartments. A room has been provided for the reception of flowers.—Although the new hospital pavilion, nurses' home, and other works at the London-road public assistance institution, Stoke-on-Trent, which cost £122,000 were formally inaugurated in November last by Lord Dawson, the pavilion has not yet been furnished or used, pending the erection of an administration block. The pavilion has room for 162 beds, and provision has been made for extension up to 819 beds.

REVIEWS AND NOTICES OF BOOKS

An Outline of Immunity

By W. W. C. TOPLEY, M.D., F.R.C.P., F.R.S., Professor of Bacteriology and Immunology in the University of London. London: Edward Arnold and Co. 1933. Pp. 415. 18s.

THERE are few books in existence which set out to tell the facts of immunity systematically and impartially. We know of none so complete, so up to date, and at the same time so readable as this one. Prof. Topley thus defines his subject:

"Immunity is a vigorous infant among the sciences, just rising 50 years. Like most young and vigorous things it is a little uncertain in its movements, a little confused in its mind, and more than a little incoherent in its speech. The growth of the past ten years has changed its outlook widely; and that growth cannot be neglected. It might be urged that a knowledge of established facts and reasonably stable theories is all, if not more than all, that can be expected from those for whom immunity is only one of many methods of approach to the problems of practical medicine. But the case is not so easily met. Ignorance of the present working hypotheses of immunity means inability to form a sound judgment on many severely practical problems. Immunological findings travel quickly, sometimes too quickly, from the laboratory to the ward and to the field. From the moment he is qualified the student will have to act on his own views with regard to the efficacy of this or that immunological procedure. It is bad for him, and very bad for medical science, that his views should be uncritical and ill-informed. And so, with no escape from controversial matters, the didactic method becomes impossible. All that can be done is to give personal conclusions and the evidence on which they are based. Every medical man must learn the art of drawing the best conclusions he can from data that are often incomplete and sometimes highly confusing. He will find immunity an excellent training ground."

This introduction shows the aspect from which the subject is approached, and it is necessary to add only that the author never shifts from this well-defined position and that his picture is always in focus. Prof. Topley has written a systematic treatise in which the various threads which hold the science together are carefully woven into one ingenious pattern. In respect of unity of plan the arrangement is a considerable improvement on that adopted in Topley and Wilson's "Principles of Bacteriology and Immunity," the first part of which covers a good deal of the same ground. Several of the chapters, such as those on the response of bacteria to the defence mechanisms of the host and that on the origin of natural antibodies, give the clearest account of these fundamental subjects we have yet seen. The fascinating modern developments in the chemistry of antigens are very well summarised. The chapter on the antigenic analysis of bacteria which has been worked out during recent years, particularly with reference to the salmonellas, is a tour de force in the exposition of a subject which often confuses even the professional bacteriologist.

Though the book as a whole is perhaps more suited to the advanced than to the elementary student, it may well exert a powerful educative influence on the more intelligent medical undergraduate. The advanced reader will find in it the best available account of immunity as a whole. As a work of reference it not only describes facts and theories without confusing detail, but provides a critical estimate of their importance. The book is a credit to the author himself and to British medical scholarship.

Evolution and Redemption

By H. P. NEWSHOLME, M.D., F.R.C.P., M.O.H. to the City of Birmingham. London: Williams and Norgate, Ltd. 1933. Pp. 267. 8s. 6d.

Dr. Newsholme is concerned to convince his readers that the good practitioner of the art and science of preventive medicine must take count of his subjects' spiritual nature as well as of their bodies, and should recognise that the purpose of man's physical existence is to express his underlying soul and spirit. It is a proposition with which few will disagree. But we could wish that Dr. Newsholme, before going to publication, had waited awhile till his exposition could have been clarified and shortened.

Arterio-sclerosis, a Survey of the Problem

A Publication of the Josiah Macy Jr. Foundation. Edited by EDMUND V. COWDRY. London: Macmillan and Co., Ltd. 1933. Pp. 617. 25s.

THE methods of investigation of which this book is the outcome have previously been used with success in the study of acute disease. They have now been adapted to the study of a chronic disease, arterio-sclerosis, which has never yet been tackled systematically. An understanding of the methods is essential if a clearer grasp of degenerative disorders and of the process of ageing is to be obtained; but great difficulties present themselves when research on an inaccessible part of the human body is attempted. In view of these difficulties, and of the importance of this condition, the Josiah Macy Jun. Foundation undertook to prepare a survey, the object of which would be to give authoritative information on all the different aspects of arterio-sclerosis.

So 23 investigators of various nationalities, including many well-known names, were invited to contribute articles on different aspects of the problem. Three objects were kept clearly in mind: (1) to determine the data concerning arterio-sclerosis which could be established and their relation one to another; (2) to discuss and to formulate definitely the principal problems awaiting solution; (3) to suggest the best means of attacking them. Each author has expressed his own views freely and we have here candid opinions and some ruthless destruction of cherished theories. While many sections necessarily consist of the statement and elaboration of well-founded facts, the accounts of recent experimental work show that here something definite has evolved. By means of feeding with cholesterin changes have been produced in certain species of animals which are regarded as equivalent to those typical of human arterio-sclerosis. D. A. Policard again describes an ingenious technique for micro-incineration by means of which it is possible to determine accurately the very earliest changes in mineral constituents in beginning arterio-sclerosis; this holds out promise of progress on definite lines. Since the final object of these investigations is knowledge on which we shall base a sound method of treatment or better still prophylaxis, we would like to think that Dr. John Wyckoff's section is unnecessarily defeatest in its tone, but we are reluctantly forced to admit the truth of his remark that "at present no evidence exists that there is any specific mode of therapy which can either cure or affect the progress of arterio-sclerosis."

After the expression of many expert opinions on different aspects of the subject, the impartial

summary provided by Dr. A. E. Cohn at the end of the book is helpful. He welds together the various views, balances one against the other, bringing out the important points in each and showing the paths along which future research is likely to be profitable. The book is undoubtedly a work of real significance. It places on record such knowledge as seems to be established on full foundation and has cleared the ground of much that has not stood the test of time and experience. The volume is handsomely produced and well illustrated.

The Anti-Slum Campaign

By Sir E. D. SIMON, M.A., M.I.C.E., Lord Mayor of Manchester, 1921–22. London: Longmans, Green and Co. 1933. Pp. 206. 2s. 6d.

THE main object of this book, as stated by the author, is to show that the Government's housing policy is wrong—wrong in its assumption about the nature of the housing problem, wrong in its action to stop the building of houses by local authorities, wrong in its proposals for pushing ahead vigorously with slum clearance now. The indictment is a formidable one, and it is sustained by moderately stated argument which will carry a large measure of conviction. The gravamen of the charge against Sir Hilton Young is that at the very moment when it became possible to bring Wheatley houses within reach of the lower paid working classes for whom they were intended, but for whom they had never been available, he cancelled the Wheatley subsidy, and fell back once more on private enterprise, which can never in fact supply the need. And further, that the whole conception of large-scale slum clearance at this stage on a comprehensive five-year programme is a faulty one, because the prime need of the present situation is more and yet more new building of houses to let at low rents whereby overcrowding may be relieved. Sir Ernest Simon holds that slum clearance now is to put the cart before the horse, and he makes a very strong case for the reverse order of operations —viz., new building until the worst of the congestion is relieved and then slum clearance. In other words the quantity stage of the problem must be dealt with first, the quality stage second.

Part I. of the book consists of an impartially written history of housing legislation since the war, and Part II. deals with the present-day problem. There are four useful appendices, two of which—dealing with the effect of subsidies on building prices, and with differential renting—are of special interest.

The book is the best analysis of the housing problem which has appeared, and is admirable alike in its treatment of past history and in its constructive proposals for the future.

History of the University of Edinburgh, 1883-1933

Edited on behalf of the History Committee by A. LOGAN TURNER, M.D., LL.D., F.R.C.S. Edin. Edinburgh: Oliver and Boyd, Ltd. Pp. 452. 10s.

THIS history of the University of Edinburgh, as is indicated on the title page, concerns itself only with the occurrences of the 50 years that have elapsed since the tercentenary celebration, which fell in 1883. Developments in all the faculties of the University are considered with some detail, and the volume ends with chapters recounting the additions made to the University library and portrait gallery and the recent improvements in the social life of the student.

In each of the two faculties which directly concern our readers, that of medicine and that of science, a fine story of progress can be shown. In medicine the growth of activity that has taken place in the last 50 years is indicated by the fact that during this period a staff of 12 professors and 2 lecturers has had to be increased to 19 professors and 48 lecturers, with a corresponding augmentation in the number of assistants. Some of these new appointments were not immediately erected into full professorships but were held as lectureships. Here an interesting commentary on the difference between the position of the professor as an academic representative of his subject in a university and the lecturer as the instructor of students is implied in the statement that before 1890 medical instruction in the University was largely or even mainly made by readers in the subjects, few professorial classes except those in anatomy being compulsory. Many students were thus instructed by extra academical lecturers but to-day the number of extra academical teachers has dwindled to vanishing point, while a variety of text-books has removed the necessity of formal lectures, the call for practical instruction being proportionately recognised. A list is given of the occupants of the chairs included under the faculty of medicine, and everywhere we are reminded alike of the past glory and the present efficiency of their holders. A further interesting category is supplied of those who, having acted as assistants to the professors or lecturers in the University of Edinburgh, have gone elsewhere to make names for themselves and assist in the progress of medicine.

The faculty of science is dealt with on the same plan and again many of those who have occupied chairs in the various subjects will be recognised as having contributed to the scientific progress of the world. Although Edinburgh has produced from very early times distinguished workers on scientific lines, the University was slow in giving official recognition to branches of science other than those which grew out of mathematics or which were accessory to the teaching of medicine. In fact it was during the recent 50 years that chemistry was transferred to the faculty of science from that of medicine, where its place was taken by a new chair of chemistry in relation to medicine. But the list of famous men connected with the faculty of science is striking, although a separate faculty was not established till 1893 and although it was only after the middle of the nineteenth century that science became seriously represented in the University.

Women students have been admitted to the University of Edinburgh since 1869, but medical students were excluded from the classes in the Edinburgh Royal Infirmary until after the Royal Colleges had resolved to admit them to their examinations. Clinical teaching was provided in the Leith Hospital until in 1892 they were admitted to the Royal Infirmary, by which date the Universities of Scotland Act had placed women on the same footing with men as regards the degrees in medicine; the University of Edinburgh announced its determination to admit women to graduation in the faculty in 1894.

The book is beautifully produced and embellished with portraits of some of the distinguished men whose life and work are categorised and with views of some of the buildings in which their work was done in connexion with the University. One of the most striking illustrations is a reproduction of William Nicholson's portrait of the late Prof. Saintbury, professor of rhetoric and English literature for 20 years preceding the war.

THE LANCET

LONDON: SATURDAY, NOVEMBER 4, 1933

THE STUDY OF IMMUNITY

THE science of immunology—let us call it by the name which, whether we like it or not, seems to have come to stay—was born amid general rejoicing in the brilliant epoch of bacteriology with which we associate the genius of PASTEUR, KOCH, and METCHNIKOFF. Chemistry, medicine, and biology might thus equally claim the honour of parenthood, but whichever the parent, all the sciences brought precious gifts to the cradle of the infant science. From its birth promising, it was asked to run before it could walk, and the results were in some respects disastrous. It was denied the tranquillity which best suits the healthy growth of young things. Its character suffered through the demand for premature public performances; the performances themselves sometimes proved disappointing and were often rightly howled down. Too many facts were explored without any serious attempt at method, and too many quests were feverishly followed because they might lead to some humane application. The workers in immunology were subjected to incessant demands for facts and principles to serve practical ends, and it is not astonishing that the "facts" extracted from them should often have been inadequately checked and the principles only partially evolved. In any case when these principles were developed in connexion with clinical medicine their dependence on controlled experiment tended to become more and more remote, and immunology often unsuspectingly received them back in an unrecognisable state.

A young science which undertakes to deal with the *ought* before the *is*, naturally tends to get into trouble. But while admittedly immunology became the happy hunting ground of amateur enthusiasts, humbugs, and even rogues, it has had its unquestioned triumphs both in theory and practice. It has provided medicine with a battery of new arms for attacking important practical and theoretical problems; it has displayed to the chemist a technique for analysis delicate beyond his dreams. It has shed some light, if even a dim one, on the fundamental riddles of biology—specificity, individuality, fertilisation, inheritance, blood relationship, even on the nature of living matter itself. It has taught the father ways of knowing his own son, the jurist new methods of unmasking the criminal. No one could say that such a science is wanting in scope or versatility; but that it still lacks precision its exponents could hardly deny. We have the more reason to be grateful to Prof. W. W. C. TOPLEY for a work, reviewed on another page, which gives a masterly survey of present knowledge and of the developments that may be anticipated in this fascinating branch of modern medicine. To TOPLEY immunity is essentially an applied science; but at the root it is as little or as much "applied" as any other physical or biological science. The facts and principles on which methods of preventing and curing disease can be based are, of course, of the utmost importance to medicine, but the corpus of knowledge of immunity has in addition a wide claim to intellectual interest. Owing perhaps to the unsystematic way in which it has been developed, the physicist, the chemist, and the biologist know little of immunity; yet if the science, even in its infancy, had been properly presented to them they would surely have found much therein to interest and inform them. That immunology has exercised a great influence, sometimes beneficent, sometimes sinister, on practical medicine, and yet has failed in the main to get the ear of general science is largely due to the lack of books which give the gist of its progress in non-technical language. Some 12 years ago a great biologist and immunologist, JULES BORDET, brought out his "Traité d'Immunité." Written in a large and leisurely style, the work summarised and coördinated many aspects of the subject which had general biological interest, and it remains one of the most thoughtful treatises on the subject so far produced. But it proved caviare to the general; the biologist found it too technical to assimilate and the immunologist for the most part was too little interested in general biology to appreciate it. H. ZINSSER[1] has done good service in digesting immunological knowledge under a limited number of main headings, but he hardly attempts to make a science of the subject as a whole. A real educational advance was made by H. G. WELLS.[2] Here at last was a book which the general scientific reader could follow with understanding and interest; only one thread of the subject—the chemical one—was consistently followed, but it was the one which perhaps gave most strength to the fabric. TOPLEY in his new work makes a further attempt at coördination, and one that commands our admiration. Though he dwells chiefly on the medical and hygienic applications of the science, he is not indifferent to the larger chemical and biological issues which make immunology worth studying for its own sake. His work should dissipate the widespread idea that immunology not only is but must continue to be an inexact science. Readers far beyond the frontiers of medicine will learn something of its discipline from his work; and to doctors it will show how much the proper study of immunological data may contribute to the cultivation of scientific progress in medicine.

THE ERADICATION OF BOVINE TUBERCULOSIS

IT is difficult to understand why, with our present knowledge of bacteriology and experimental epidemiology, a method of dealing with tuberculosis in cattle should be sanctioned that is based on principles which, though regarded perhaps fifty years ago as enlightened, are no longer in

[1] Resistance to Infectious Diseases. 4th ed. London. 1931.
[2] Chemical Aspects of Immunity. 2nd ed. New York. 1930.

accord with modern conceptions. The Tuberculosis Order, 1925, rests on the assumption that it is possible to eliminate tuberculosis by the detection and subsequent slaughter of animals suffering from disease, generally of an advanced type. It disregards the fact that the diagnosis of tuberculosis in cattle can rarely be made from signs or symptoms until relatively advanced lesions are present, and that even when supplemented by a bacteriological examination it entails keeping an animal in a herd for a period of several weeks after it has become infective before it is finally condemned. Even if a special staff of trained veterinarians was employed throughout the country in sufficient numbers to examine every animal four times a year, it would be quite impossible to eliminate any considerable proportion of the animals before they had succeeded in transferring infection to those around them. The surprising fact is, not that the 1925 Order has proved ineffective, but that anyone should ever have seriously considered it capable of leading to any marked diminution in the extent of tuberculous infection among cattle. Only a small percentage of animals infected with the tubercle bacillus, as revealed by the tuberculin test, show recognisable signs of disease, and experience has proved that, if tuberculosis is to be eradicated, all infected animals must be removed from the herd. The success of the American method, depending as it does on the testing of every animal with tuberculin, the slaughter of all the reactors, and the addition of fresh animals only from tuberculosis-free herds, is well attested, and there is no doubt that in practice the scheme has worked. Its great objection is the expenditure involved in compensation of the owners. Though a few of the more educated and wealthy stock-breeders in this country have adopted some of the principles underlying the American method and have succeeded in building up tuberculosis-free herds, there are good reasons why it could not be applied simultaneously over the whole of Great Britain. The alternative is to adopt a modification of the method which allows the positive reactors to be kept on the farm, segregated from the non-infected group, until such time as they can conveniently be sold off. The real difference between the ideal method and its modification is that the former demands the immediate slaughter of the reacting animals, while the latter permits the owner not only to keep them on the same farm for some time in a potentially infective condition, but to sell them subsequently in the open market for transfer to other herds.

Advocates of this modified and much less costly method have hitherto had little evidence to present in support of its value, but a recent report [1] to the Medical Research Council by Mr. LESLIE JORDAN, Ph.D., veterinary pathologist to the Hannah Dairy Research Institute, goes a long way to fill up this lacuna. The experiment that Dr. JORDAN describes was carried out during the three years 1929–1932 in an area of nine square miles in Ayrshire, and consisted in an attempt to ascertain how far it was practicable under field conditions to diminish the incidence of tuberculosis in cattle by a method involving a minimum of expense to the owner. Tuberculin testing and veterinary advice were provided free of charge, and the only direct cost to the owner consisted in minor alterations in buildings and periodic disinfection of premises. Altogether 30 milking herds were included. The average size of the farms was about 150 acres, and the average number of milking cows was 26 per herd. Ten of the herds had been tested at some time previously with tuberculin, and five of them were believed to be free from reactors. The first test, carried out on 1475 animals, revealed 26·1 per cent. of reactors. Eight of the herds were found to be free from tuberculosis, while the proportion of reactors in the remaining 22 herds varied from 1·3 to 69·5 per cent. The general procedure advocated was designed to cause a minimum disturbance in farm routine. Each herd was divided into two groups, and whenever possible the infected group was housed in separate buildings. If this was impracticable, the reactors were housed at one end of the barn and the non-reactors at the other, every care being taken to avoid the occurrence of cross-infection. Reactors were grazed in separate fields from non-reactors, common water-supplies were eliminated, and infection from manure was guarded against. Valuable reacting cows were retained until after calving, unless they had symptoms of tuberculosis, and calves from reacting dams were fed on non-reactors' milk. The clean portion of the herd was recruited from young non-infected stock mostly bred by the owners themselves. Every herd was re-tested with tuberculin at six-monthly intervals. On the whole the experiment worked well, and the proportion of reactors fell gradually. Two of the owners, however, failed to coöperate satisfactorily, so that in their herds the proportion of reactors was actually higher at the end than at the beginning of the observational period. The seventh test, made at the expiration of three years on a total of 1635 animals, revealed the presence of only 12·3 per cent. of reactors, and showed that whereas at the commencement only eight herds were free from tuberculosis, at the termination of the experiment no fewer than 20 herds fell into this category. Considering that this was in the nature of a preliminary experiment, and that during its progress a considerable amount of practical information was obtained which would be of value in the making of a fresh attempt, there is every reason to regard the results with complacency.

Discussing the general question of tuberculosis eradication, Dr. JORDAN has some hard things to say against the 1925 Order. In its twofold object of limiting the spread of disease among cattle and of reducing the infection of the milk-supply, it has proved a failure. He brings striking evidence to show how frequently tuberculous animals succeed in spreading infection before they are recognised as clinical cases and removed from the herd. Thus, examining 32 hitherto untested herds

[1] Special Report Series No. 184. 1933. H.M. Stationery Office. Pp. 104. 2s. net.

by the tuberculin reaction, he found that in 16 of them, in which there was no history of a clinical reactor, the proportion of reactors was 53·1 per cent., whereas in the remaining 16 herds, in which a clinical reactor had been removed under the Order within the past two years, the proportion was 82·3 per cent. These figures are the more significant in that they concerned herds located in a country where periodic inspections under the Milk and Dairies (Scotland) Act, 1914, were regularly made. Similarly, evidence is produced to indicate that veterinary inspection with manual palpation of the udder, even when carried out intensively, is incapable of ensuring freedom of the milk-supply from tubercle bacilli. The estimated cost of the Tuberculosis Order for Great Britain is £120,000 per annum. The estimated cost for conducting the modified eradication policy pursued by Dr. JORDAN is £1000 per annum for every 5000 head of cattle. On this basis, if the money now spent annually in administering the Order was employed for furthering a voluntary scheme of tuberculosis eradication, it would be possible to deal with 600,000 head, or about one-tenth of the cattle population of Great Britain. The scheme described in Dr. JORDAN'S report is not ideal—far from it. Besides requiring a fairly high level of intelligence and conscientiousness on the part of the owner and his farm assistants, it necessitates the disposal of known reacting animals in the open market, and the consequent potential spread of infection to other herds. Since a high proportion of animals exposed for sale in public markets are already infected, the addition of a few extra reactors may be considered as of no great moment: but this holds true only during the early part of the operation of such a scheme while there are still plenty of owners willing to buy up reacting stock. If the scheme was widely adopted and made considerable progress, the problem of disposing of reacting animals, other than by slaughter, would become a very real one. This is, however, looking too far ahead. The great merit of the experiment here recorded is to show that by a voluntary process, entailing no other cost than tuberculin testing and veterinary advice on methods of isolation and rearing of young stock, it is possible to free from infection a considerable proportion of tuberculous herds within the short space of three years.

HOUSING AND MALARIA

SINCE 1931, when CLAYTON LANE'S report was published by the League of Nations,[1] fresh information has accumulated; so that, although the problem of housing and malaria is now in some ways less simple, certain of his questions have been answered. This is made clear by a valuable summary of present knowledge which has been written by Sir S. RICKARD CHRISTOPHERS and Prof. A. MISSIROLI.[2] From their detailed and fully documented paper a few points may be selected for notice. The view is accepted that the house is the spot where man and mosquito are most likely to meet, the place above all others where man is most likely to be bitten by the infective anopheles. In Europe for practical purposes that insect will be *Anopheles maculipennis;* but close study of this species has led to its division into four zoological varieties. Two of these, *A. maculipennis messeæ* and *A. m. maculipennis* are widely distributed, do not feed on man when cattle are available, and in winter hibernate completely. The other two, *A. m. atroparvus*, found in Holland in brackish low-lying areas, and *A. m. labranchiæ*, reported only from central and south Italy, feed on man as well as on animals and undergo only partial hibernation. That is to say, they feed readily during winter but do not oviposit; accordingly the instinct to do so does not drive them from the house to the breeding-place every two or three days, as it does in summer. Hence they run no chance of wasting malarial sporozoits on cattle, and they can and do infect man readily both in winter and in summer. These two subspecies are found in those European areas where malaria persists, and it is not yet known whether tropical species of anopheles show a similar association between differences in anatomical structure and in habit. Moreover, when such gonotropic dissociation does not exist, the female does not limit her excursions to occasions for oviposition; indeed, it is estimated that the turnover in a given shelter may amount to three-quarters of the anopheline population nightly. An interesting point brought out in the new report concerns the mosquito's counter-move to the undesigned efforts to smoke it out which are made when cooking is done in chimneyless huts. In such places the smoke may be so dense that breathing is impossible unless the dweller squats on the floor, and in these circumstances it is only on the lower part of the walls that mosquitoes will be found. It is agreed that light and air in the house discourage the presence of a large anopheline population, but it is pointed out that these conditions do not greatly deter the entrance of mosquitoes into dwellings, especially at night.

So it is on screening that the emphasis of this paper is placed. For this to be successful, however, certain conditions must be strictly observed. The building must be suitably built, the screening must be efficiently done, and as efficiently supervised in its working, there must be regular destruction of all insects which may enter, and there must be effective propaganda, tuition, and example, with a people intelligent enough to be capable of interest in their own health. Moreover, the screened house or room may be unbearably hot and close without some form of mechanical fan. As CHRISTOPHERS and MISSIROLI note the issue of screening really lies in the sphere of human difficulties and human imperfections, and there is no present prospect of so far improving the housing of the indigenous inhabitants of many non-European countries that screening will take any effective place in preventing infection. All of which but serves to bring out the inseparable connexion between housing and malaria.

[1] See THE LANCET, 1931, ii., 306.
[2] Quart. Bull. Health Organisation League of Nations, 1933, ii., 355.

ANNOTATIONS

THE LEEDS APPEAL

"TAKING the history of medicine in the last 160 years, there is not one single individual in the whole world who does not owe a direct obligation to the work done in Leeds General Infirmary"—thus Lord Moynihan without exaggeration at a dinner last week in Leeds at which an appeal was launched for a quarter of a million of money. So great a sum has rarely been asked for in a breath by any provincial hospital, but such are the cogency and urgency of the appeal that £76,000, nearly one-third of the amount asked for, has already been promised. The Leeds General Infirmary has never been a merely local institution, and to-day two-fifths of its patients come from outside. During the last decade the pressure upon its accommodation has greatly increased, but there has been no amelioration of the difficult conditions under which the honorary medical staff have to work. Every year some 47,000 new out-patients are dealt with; and on the average 1000 of them are examined and treated every day in space so exiguous that four patients have to be examined simultaneously in the same room. The consequent noise and confusion are distracting to the doctor and disturbing to the patient.

A remedy for this state of things is now to be sought by converting the present operating theatres into rooms for medical out-patients, with the collateral advantage of providing six new modern theatres capable of dealing with operations which have so increased that last year they exceeded 12,000. A new ward block will form a casualty department on the ground floor, while the upper floors will provide beds for from 80 to 100 paying patients. All this necessarily involves more accommodation for nurses, and £30,000 is to be spent in bringing them under one roof, while "obsolete and inefficient" kitchens are to be reformed. It is often complained that hospital enlargements mean extra annual expenditure, but the Leeds board of management are satisfied that in this case maintenance costs will be reduced, the waiting-lists of 1700 shortened, and £3000 a year saved in interest upon the overdraft of £86,000 which a successful appeal would wipe out. Moreover the pay-bed department, according to all experience, would earn a profit. Seeing how large a proportion of the proposed expenditure consists in the wiping out of a crippling debt there is clearly nothing extravagant about the scheme. Not only will these plans, when realised, enure to the interests of the suffering poor and to the sick of the middle-class to whom costly private treatment is impossible, but, what is ultimately of at least equal importance, to the interests of research and medical education. The Leeds School of Medicine, now a faculty of the University and more than a century old, grew out of the Infirmary, and the two have always been inseparably connected. They have grown together, and more than 20 years have elapsed since the union was completed when the clinical teaching at the Infirmary was placed under the control of the University. How happy has been this union students of medical science are well aware, and it is not Yorkshire alone that will benefit by the success of the present appeal.

PROBLEMS OF MYOPIA

IT was Donders who created the conception and the term emmetropia. The emmetropic eye was the ideal structure which focused parallel rays of light on the retina without the dynamic action of accommodation. Such a view of the ideal implied that the human eye was to serve essentially for effortless distant vision; near vision was an additional function which involved expenditure of energy in the process of accommodation. The implication of Donders's work passed without challenge for wellnigh half a century and it was only in 1912 that A. Steiger questioned the whole basis on which the study of refractive errors had been placed. There is no particular reason why Donders's mechanical ideal should be accepted as a desirable normal. It may be argued that under conditions of civilisation a low degree of myopia is by no means a handicap, for distant vision does not suffer greatly, whilst there is the gain that near vision is possible without the effort of accommodation. More significant than such teleological discussion is the consideration of the actual distribution of the refractive states. Writing in our own columns recently on developmental myopia Sir John Parsons remarked that practically all mammals are hypermetropic and that the frequency curve in man had apparently shifted towards the emmetropic condition. In the terminology of Donders every departure from emmetropia is a refractive error; in actual distribution the prepondering majority of people have eyes that are not emmetropic. Helmholtz, a contemporary of Donders, expressed his low opinion of the eye as an optical instrument, but it is a question whether the criteria of perfection applied by the mechanistic nineteenth century should stand for all time.

The service that Steiger rendered to the understanding of the complicated problems involved consisted in stressing the fact that like all measurable quantities, the refractive power of the eye shows variations around a mean maximum distribution. This, too, is essentially a mechanistic outlook, for it does not apply a functional standard as the centre around which variations occur. Actually, it is found that low hypermetropia is the most frequent state, and departures from this state decrease in number the greater the difference from the mean. But whilst Steiger held that refractive states would follow a binomial curve, subsequent work has shown that the actual curves have no such character. For one thing there is a marked excess of refractions approaching low hypermetropia and a less marked excess in the region of high myopia. The symmetry that Steiger postulated is non-existent; he was, it seems, wrong in his postulate for, as W. R. Dunstan has pointed out [1] symmetrical polygons are not always obtained when data of the incidence of measurable variations are plotted. Steiger's failure to explain the whole gamut of refractive conditions raises the problem of correlation. Obviously some such process must be at work if the different components of refraction produce a low hypermetropia of much greater frequency than is to be expected theoretically. To this process of correlation A. Sorsby attaches fundamental importance in the elucidation of the problem of myopia.[2] Granted a physiological myopia as part of the range of variations, the excess of myopia over its theoretical incidence has still to be explained. Furthermore, Mr. Sorsby argues that the behaviour of the myopic eye is different from that of the non-myopic eye; the fact that myopia develops after the eye has completed its normal growth also calls for a conception of myopia which regards it as different

[1] Medical Officer, 1932, xlviii., 111.
[2] Brit. Med. Jour., Oct. 21st, p. 730 THE LANCET, Sept. 2nd, p. 542

from the other refractive states. The explanation of myopia demands an exhaustive study of the changes in the premyopic state. We want a fuller understanding of the physiology of the growing eye, of the process of correlation during the period of growth, of the presumably great change in the anterior segment of the eye which neutralises the 30–40 dioptres increase in refraction caused by elongation of eye during the process of growth, and of the value of the different components of refraction during the active phase of developing myopia.

LETTSOM

John Coakley Lettsom was born in the West Indies in 1744 and became the leading physician in London, where he died in 1815. He was a Quaker and implacably industrious—two qualities common to many great men—and as he knew everyone from the court to the gaols and had his finger in almost every available pie, an account of his life and contacts such as Mr. Abraham has written [1] makes a straggling picture in which the hero is not always very visible. And in following up, generally in great detail, a good proportion of the side tracks which Lettsom's activities brought him to, he has, we think, produced a more generally acceptable book than a compact and exclusive biography, for we learn a good deal about a number of interesting people and occasions which would never have been monographed for their own sake. Lettsom started in practice in London under favourable auspices: "many amiable females conceived it an honour to have his acquaintance," and he was the protégé and, later, the successor of Dr. John Fothergill. In the first two or three years, after he was married and set up in 1770, he published "Reflections on the General Treatment and Cure of Fevers," "The Natural History of the Tea-tree, with Observations on the . . . Effects of Tea Drinking," and "The Naturalist's and Traveller's Companion," and so he went on through life. He founded the Medical Society of London in 1773, and was elected into the Royal Society; he had much to do with starting the Royal Humane Society, in promoting Jenner's claim to have found out something useful, in prison reform, and (which Mr. Abraham thinks his most original achievement) in founding the Sea-Bathing Hospital at Margate (1791). And in telling this tale Mr. Abraham makes us acquainted with all sorts and conditions of people Lettsom met by the way, such as Dr. John Whitehead, who quarrelled with the Medical Society and survives in a picture of John Wesley's death-bed, or pretty Betty Fothergill, who was not overpleased when Lettsom married someone else, or the Americans Waterhouse and Rush. Wherever one dips there is something worth reading about, and generally some germane pictures. The book is sure to be a great success, and our only quarrel with it is that it is printed on such heavy paper that it is physically awkward to read in the desultory moments for which it is particularly suitable.

EXANTHEMA SUBITUM

Dr. Maria Abb,[2] of the Children's Clinic of Würzburg University, puts the question whether the condition known as exanthema subitum is an independent disease or not. It was first described under the name of roseola infantilis in 1913 by Zahorsky, who had seen 33 cases in infants under 2½ years of age. In 1921 Veeder and Hempelmann gave it the name of exanthema subitum, and since then numerous cases have been described in Hungary, Germany, Switzerland, and elsewhere, though not in this country. The characteristic features are cough, sneezing, conjunctivitis, glandular enlargement, a fever of three days' duration, and a maculo-papular eruption which appears as the fever is subsiding and disappears in 24 hours without leaving any desquamation or pigmentation. The blood shows a leucopenia and relative lymphocytosis. Complications do not occur, and recovery always takes place. So far no agreement has been reached about the ætiology. While most clinicians regard exanthema subitum as an independent disease, owing to the peculiar course of the fever, the eruption, and the blood picture, Ido, Willi, Friedrichson, Göttche, and Rietschel consider it to be merely a manifestation of influenza. As the result of her observations in Prof. Rietschel's clinic, Abb comes to the conclusion that exanthema subitum is not a disease sui generis, but is merely an influenzal infection in which the eruption represents an allergic reaction. The final decision, however, as she points out, must be left to bacteriologists, who have as yet paid little attention to the condition.

NATIONAL INSTITUTE FOR THE DEAF

THE ninth annual report of the executive committee of the National Institute for the Deaf must have been a satisfactory document to those who issued it, for the story is one of real progress. The report of the chairman, Lord Charnwood, shows that despite the considerable public misconception of the affliction under which deaf persons suffer, the work of the Institute has grown rapidly, while the inquiry carried out by the late Dr. Eichholz, which made its appearance as a Government report, had produced a powerful effect on the public and official mind. There are now maintained by the Institute the Richardson House at Barrowford and the Poolemead House at Tiverton-on-Avon, both for women, a hostel for working deaf boys at Highbury Quadrant, and a centre of instruction in lip reading which is in regular session at the Swedenborg Rooms, Hart-street, London. For the management of the two latter, Mr. A. J. Story, the secretary of the Institute, is responsible in addition to other duties. Further evidence of a widening of sympathy is shown by the foundation of bodies affiliated to the Institute; these are six in number, viz., the Northern, Midland, and Eastern Counties' associations, the London and Home Counties' association, and the Scottish association. The record of activity is aptly assisted by a favourable pecuniary position. The Institute is not rich—so far from this, its need for money is real; but its developments have been carried on within its resources, and the hon. treasurer, Mr. John Tennant, was able to announce the possession of a favourable balance.

BONE-GRAFTING FOR RECURRENT SHOULDER DISLOCATION

A COMMUNICATION to the French surgical congress recently held suggested a successful form of treatment for relapsing dislocation of the shoulder-joint. Dr. S. Hybbinette, senior surgeon to the Sabbatsberg Hospital in Stockholm, has during the past 16 years inserted a bone graft in 31 cases with complete restoration of mobility of the joint in 29 of the cases, along with a sense of security which enabled the patients to regain their normal working capacity. The case which gave the clue to this operation was that of a woman, an epileptic, whose shoulder had been out of joint some hundred times, and on whom Dr. Hybbinette operated in 1917.

[1] Lettsom: His Life, Times, Friends, and Descendants. By J. Johnston Abraham, M.D., F.R.C.S. London: William Heinemann, Ltd. 1933. Pp. 498. 30s.
[2] Zeits. f. Kinderheilk., 1933, lv., 339.

Having freely exposed the joint, he found that its capsule was detached from the whole of the lower half of the circumference of the glenoid cavity. The periosteum had been displaced with the capsule, being detached from the anterior surface of the neck of the scapula. Not only was the articular cartilage of the glenoid cavity missing, but its bony margins were also worn down. The discovery of this condition suggested a bone graft which, inserted into the periosteal pocket formed by the chronic state of dislocation, would, by forming a new bony margin to the glenoid cavity, deepen it and thus facilitate the retention of the head of the humerus within it. Should the periosteal pocket not have been created by previous dislocations, it can be artificially made at the time of the operation by the detachment of periosteum from the anterior surface of the neck of the scapula. The bone graft is taken from the crest of the ilium. The operation is followed by an immobilisation of the arm in a scarf for a fortnight, at the end of which the patient is allowed up. After three weeks he makes movements of his arm in various directions only in so far as they cause no pain and encounter no obstruction. Six weeks after the operation he can usually raise his arm to the level of his shoulder, and put his hand on his forehead, nape of his neck, and back. At this stage he begins energetic, systematic exercises, which three months after the operation restore him to a complete capacity for work, even hard work. In the two cases in which the operation did not completely restore full working capacity it was partially vitiated by a local infection in the one case, in association with an attack of influenza, and by a fracture of the glenoid cavity with displacement of the bony fragment in the other.

OLD MICROSCOPES

Mr. R. A. Clay, D.Sc., and Mr. T. H. Court have compiled from original instruments and documents a History of the Microscope [1] up to the introduction of the achromatic lens. To the busy worker with the microscope, concerned more with the practical application of its disclosures, a volume such as this might not have an immediate appeal. The fact too that it deals with an early period, before the evolution of the achromatic microscope on which present-day work entirely depends, might still further tend to reduce his interest. And yet many who have even the slightest acquaintance with the mechanics and optics of the microscope can hardly fail to find here much that is fascinating even apart from its historic value. The writers are acknowledged authorities on the history of what is still the most important optical instrument. They have compiled with meticulous care and with great accuracy an account of such early microscopes, whether in this or in other countries, as may be necessary to unfold the story of its early evolutionary period. The information so gathered together is based upon examination of the instruments themselves; most of the examples described are to be found in the Science Museum at South Kensington or in the collection of the Royal Microscopical Society now being exhibited at B.M.A. House. Among living collectors Mr. Court holds a foremost place. Not only has he devoted many years to the gathering together of historical optical instruments and documents relating thereto, but he acquired many of the gems in the unrivalled collection of the late Sir Frank Crisp when its disposal at auction took place in 1925. Many points in early design and construction are suggestive of present-day practice, and the story may be commended to all who desire to know what is worth learning of a period when mechanical improvements were rapid but optical developments were awaiting disclosure of still unsuspected physical principles. Craftmanship was at a high level, particularly in this country which had such masters as Chippendale, and the influence of skilled workmanship is seen in the body-tubes of some of the microscopes described and even in the cases which contained them. The book is fully illustrated from photographs.

[1] London: Charles Griffin and Co., Ltd. Pp. 266. With 164 illustrations. 30s.

MAGISTRATES IN THE NEW JUVENILE COURTS

ONE of the provisions of the new Children and Young Persons Act is to set up juvenile courts under the care of justices chosen by panels of the bench of each area. These tribunals will have a delicate task, and the problems they will have to solve were the main subject of discussion at the conference of the Magistrates' Association held in London last week. As Lord Feversham pointed out, juvenile crime is likely to increase for a number of years with the increase in the number of children leaving school. The causes are numerous: unemployment is perhaps the chief, but another, as Mrs. C. D. Rackham suggested, is the fact that large numbers of boys and girls go straight into unregulated employment at 14, and are not eligible for national health or unemployment insurance benefits until two years later. Even if they pass into the factory or the shop the legislation that protects them is inadequate and out of date; it allows them to work for 60 and 72 hours a week respectively, with no medical attention. She considers that the overwork, strain, and lack of leisure and interest to which many young persons are subjected are a fruitful source of crime. The magistrates of the juvenile court, if they are to do their work properly, must be familiar with these and other predisposing causes of adolescent wrong-doing. At the same time when one reads [1] that in Manchester, for example, there will be 46 magistrates on the panel and that each of them will only do three days' duty a week for three weeks in the year, it is hard to see how they are going to acquire much skill through actual practice.

Recognising the importance of the new opportunity, the Magistrates' Association invited Dr. R. D. Gillespie and Dr. Helen Boyle to address them. Dr. Gillespie explained the scope and aims of the scientific method, and Dr. Helen Boyle pointed out the defect of the new Act in not sufficiently providing for psychological examination of the delinquent. Only five lines of the Home Office circular,[2] she said, dealt with medical examination, and she appealed to the magistrate, as the captain of the ship, to use the psychiatrist as his navigator in the rock-strewn seas. The subsequent discussion was illuminating as showing the views which magistrates of practical experience and conscientious sympathy with the medical side have formed. Mrs. P. E. Cusden, of Reading, pleaded for more use of the temporary provisions of the Mental Treatment Act, and a member of the Worthing bench spoke highly of the value of the local out-patient clinic for mental disease. Mr. Claud Mullins asked the psychiatrists to assure him that he could obtain effective treatment for any offender whom he considered to need it. The psychiatrists, he said, confined themselves almost entirely to diagnosis and were silent about treatment and results. In the two years he has been on the bench he has found his instincts entirely opposed to imprisoning

[1] Manchester Guardian, Oct. 28th, p. 13.
[2] See THE LANCET, Sept. 23rd, p. 711.

certain types of sexual offenders, such as exhibitionists and homosexuals, but having no sure prospect of sending them away to get cured he has been forced to continue to sentence them to prison. Dr. Gillespie, in reply, said that treatment was long and costly, and was hindered chiefly by economic considerations. The Institute of Medical Psychology, he explained, had 1 paid whole-time officer and 11 voluntary assistants who could spare only a part of their time.

RADIUM AT THE CENTRES

THE report of the Medical Research Council on medical uses of radium, summarising the work of the research centres in 1932,[1] shows, in spite of the scarcity of money, substantial advances in many fields. The centres are sending in less information concerning new developments in radiotherapeutic technique, for much of the ground has been sufficiently covered. On the other hand, statistical information has gained in value, as it now covers a large enough number of years to allow conclusions to be drawn with some certainty. More experimental work in radiology is being done than has ever been undertaken before. There have been several additions to the research centres, and the allocation of radium to the Council by the Radium Commission has given a great stimulus to general research into the action of radium on normal and malignant tissues. As larger quantities of radium become available for application externally, the tolerance of the skin becomes more and more important, for this factor limits the dose which may be given by any one port of entry. The report mentions several papers which seem to show that skin tolerance does not entirely depend on the time over which a dose is fractioned but also varies with the region of the body which it covers and with its own blood-supply. The new observations may, suggests the report, be very significant if they tend to cast doubt on the reliability as a unit of the skin erythema dose. For instance, observations in the Manchester Royal Infirmary and Holt Radium Institute seem to indicate that the skin of the scalp is about 50 per cent. more tolerant than the skin of other regions, these being grouped as if they all reacted in the same degree. Dr. J. C. Mottram has shown, in a communication to the Council, that regions with a depleted blood-supply react less than normal areas and that the skin of the face is more sensitive than that of the neck. If the skin is in any way a typical organ of the body, suggests the report, similar differences may be discovered in other organs and tissues, and the reaction to irradiation of a patient suffering from malignant disease may be proved to be not simply a question of the direct action upon the tumour but also of the general physiological response of the individual. These developments bear out the recent work of Dr. B. D. Pullinger on the indirect action of radium in affecting the blood-supply to a malignant growth.

The advantage of spreading the dose over a long period is being more and more recognised by radiologists, and the Radium Institute, which has just issued its annual report for 1932, has recently brought all its radium apparatus under review. Many of the tubes and applicators of high content have been dismantled and smaller units have been constructed. The flat applicators now fall into two groups: "full strength" containing 5 mg. and "half strength" containing 2·5 mg. of radium element per square centimetre. They are all square or rectangular, these shapes being more convenient for the treatment of certain surface lesions. Applicators of higher content can be made up out of the smaller units. The Institute has modified its technique for treatment of carcinoma of the cervix, and is well satisfied with the results which have so far been obtained. Intrauterine and vaginal applications are still combined and the former have not been changed, but by increasing the secondary screening of the vaginal applicators from 1 mm. to 5 mm. it has been found possible to increase the dose without infringing the limits of tissue tolerance. Vulcanite or bakelite is now used instead of para rubber; the applicators are spheroidal or cylindrical with rounded ends, so that the pressure on the vaginal walls is more even. This arrangement will probably obviate the severe immediate reaction and delayed radium necrosis which used to occur in some cases where there was not sufficient room in the fornices for the lead tubes which were then inserted. The secondary screening was of rubber, but undue pressure from the ends was doubtless a predisposing cause. The activity of the applicators has been increased from 10 mg. of radium to 15 millicuries of radon; the primary screening is 1·5 mm. of platinum as before. The applicators are inserted under a general anæsthetic and left in position for 48 hours; another 48 hours later a vaginal application is made with the patient in the knee-chest position under the influence of scopolamine and omnopon. A week after the first combined application another is given. The total dose is 2880 mg. hrs. in the uterus and the equivalent of 5500 to 7300 mg. hrs. in the vagina, depending on whether three or four capsules are used. The old dosage in the vagina was 5040 mg. hrs. The new dosage has not caused local damage or any abnormal irritation of the rectum. The radon is to be replaced by radium as soon as more radium is available. The results of the new technique will be awaited with interest.

Although the development of technique has tended to slacken, there is still, it seems, room for ingenuity in rectal carcinoma. Although for many years growths in this site have been looked upon as hopeless or radio-resistant, some have responded well, and the Council sees indications that, with greater experience and better understanding of the dosage, treatment is becoming more effective. Its tables show 2 cases out of 8 surviving from 1926, 5 out of 31 surviving from 1928, and 4 out of 37 surviving from 1929. On the other hand, the five- and four-year survival figures from the Institute are negligible. The results from different clinics vary considerably, the best being from St. Bartholomew's, and this variation suggests that close study would produce interesting and helpful data.

[1] Special Report Series No. 186. London: H.M. Stationery Office. 1933. Pp. 36. 1s.

ULTRAFILTRATION IN BACTERIOLOGY

FILTRATION has long been an integral part of bacteriological technique. Its uses—the separation of bacteria from their toxins, the sterilisation of fluids, and the separation of filtrable viruses from the ordinary bacteria—are well known. But the ordinary bacterial filters, even at their best, are unsatisfactory for some of these purposes. Especially is this so in the filtration and separation of filtrable viruses, where loss by adsorption and the inability to produce a closely graded series of efficient filters of varying porosity, has set a limit to their usefulness. This has led to the adaptation of collodion filters to bacteriological research—the so-called technique of ultrafiltration—and their use is extolled in a paper by R. Le Guyon.[1] He illustrates the value of ultra-

[1] Ann. de l'Inst. Pasteur, 1933, li., 377.

filtration by examples from his own researches, and giving the details of his technique, he points out how much of the work in the past has been vitiated by the inability to reproduce at will collodion filters of a given porosity and even pore size. Those engaged in the study of viruses in this country will readily agree with this; in fact as far as they are concerned Le Guyon is preaching to the converted. But it is somewhat surprising to find so enthusiastic an advocate of ultrafiltration so sadly ignorant of what is happening beyond the confines of his own country. True he mentions the work of Bronfenbrenner on electrodialysis, but from beginning to end of his paper there is not one word of the work of W. J. Elford. The researches which Elford has carried out at the National Institute for Medical Research during the last few years, which have culminated in the production of the gradacol ultrafilters, stand in a class by themselves, and ample proof of the utility of these gradacol filters in the study of viruses has now been furnished. The size of many of the viruses has been determined with an accuracy not hitherto achieved. Moreover, by the selection of suitable filters it has been possible to free viruses from extraneous material and obtain them in a state of relative purity, and there can be little doubt that this has been of immense help to J. E. Barnard in his study of viruses by ultra-violet dark ground photomicrography. When, too, it is recalled that with gradacol membranes it is possible to separate viruses differing no more than 10 mu in size of particle, it will be realised to what a high degree of perfection ultrafiltration has been brought. The days of the filter candle seem to be numbered.

JUVENILE RHEUMATISM AND ENVIRONMENT

A REPORT issued some years ago by the Medical Research Council [1] showed that the children living in certain poor-law residential schools were relatively free from rheumatic infection compared with children of their own class who were living at home. Dr. James L. Newman [2] finds a similarly low incidence among the mentally defective children in the Fountain Hospital, Tooting, and endeavours to explain it. Included in his study are 1200 patients already removed from hospital and 500 who were there at the time of his investigation. The average age on admission for the combined series was about 6 years and the age on discharge, while varying somewhat, was at about 10 for boys and 14 for girls. The children's social status was such that had they been mentally normal they would almost all have attended public elementary schools, and they may thus be regarded as fairly representative of working-class children of the age when rheumatic infection usually appears. Yet the total incidence of rheumatism arising in the hospital was only 0·4 per cent. It is still not very easy to find satisfactory figures for comparison among children living at home, but even if the comparatively low estimate of 2 per cent., quoted from J. A. Glover, is accepted the disparity is considerable. The standard of clothing, as would be expected, was very good, and exposure to adverse weather conditions was almost nil. Further, the wards at the Fountain Hospital are well-ventilated and kept at an even temperature. On the other hand, the buildings stand at a low elevation very near a river, and "there is strong presumptive evidence that these wards are actually damp." Dr. Newman thinks that the rooms in which the children live are probably damper than the middle floors of dwelling-houses, where the incidence of rheumatism is at its lowest, but not as damp as the ground-floor rooms, without a cellar below them, which provide the greatest incidence. As regards diet he believes that while the purely nutritive value is quite satisfactory there is evidence of inadequacy in the supply of vitamins, so that "the children are perpetually kept round the borderline of deficiency, requiring only a period of diminished food intake or perhaps a mild physical attack to upset their balance and produce definite pathological changes." Probably about 60 per cent. of those under investigation had an unhealthy nasopharynx. There were no signs of vermin among them; and, epidemiologically, their position is described as one of comparative isolation; nevertheless the incidence of scarlet fever in this series of 1700 children was 21 per cent., which is in evident contrast to that of rheumatism. Where the question of a nervous factor is concerned, the nature of the primary malady makes any conclusion somewhat tentative; but it may be noted that the children keep good regular hours and competition is absent from their labours. Summing up the various possibilities Dr. Newman introduces a useful comparison between the incidence of rheumatic infection at Eton and in the poor-law schools. On the whole he is inclined to think that the principal reasons for the low incidence of rheumatism at the Fountain Hospital are the absence of overcrowding and the moderate and equable temperature in which the children live.

[1] Med. Research Council, Spec. Rep. Ser. No. 114. London. 1927.
[2] Jour. State Med., October, 1933, p. 590.

THE FitzPatrick lectures of the Royal College of Physicians of London will be given at the College, at 5 P.M., on Tuesday and Thursday next by Sir Humphry Rolleston. His subject is the History of the Endocrine Organs.

THE chairman and treasurers of the Westminster Hospital are issuing this week a public appeal for £350,000, the sum needed to carry out the rebuilding of the hospital on a new site in the Horseferry-road, Westminster. The governors of the hospital have an option upon this site until March 31st next, by which date the first instalment of not less than £100,000 must be available.

FOR the first time since 1921 a week has passed in which no case of small-pox was reported in England and Wales. Since the beginning of the year only 546 cases have been notified, compared with 1553 in the same period of 1932. The last year in which the total number of notifications fell below 2000 was 1922, and during each of the five years 1926–30 it exceeded 10,000, reaching a maximum (14,767) in 1927. No death ascribed to the disease has been recorded since the week ended on March 25th.

DONATIONS AND BEQUESTS.—Under the will of the late Miss Maria Richardson, who left estate of the gross value of over £157,000, the testatrix bequeathed £1000 each to St. Dunstan's, the Cancer Hospital, and the Cancer Research Institute. After other legacies the residue of the property will be divided equally between the Royal National Lifeboat Institution; the Royal Society for the Prevention of Cruelty to Animals; the Cancer Hospital; the Cancer Research Institute; the Miller Hospital, Greenwich; Charing Cross Hospital; the British Home for Incurables, Streatham; St. Dunstan's Hostel; the Hospital for Consumption, Brompton; the Royal Albert Orphanage for Boys, Bagshot; the National Hospital for Paralysed and Epileptic; the Asylum for Idiots, Earlswood; and Earl Haig's British Legion.

THE PREVENTIVE ASPECTS OF MEDICINE

A Series of Lectures in progress during the Winter Session at King's College Hospital Medical School

IV.—THE PREVENTION OF MATERNAL MORTALITY *

IT is frequently stated in the lay press that 3000 women die annually in England and Wales as the result of childbearing. That this figure is approximately correct is borne out by the number of deaths from this cause recorded by the Registrar-General in the year 1928; it was 2920.

Table I. illustrates the maternal mortality figures in England and Wales in decades from 1855.

TABLE I

Years.	Death-rate per 1000 births. Total.	Puerperal fever.
1855–64	4·7	1·6
1865–74	5·0	1·9
1875–84	4·6	2·3
1885–94	5·1	2·6
1895–04	4·6	2·1
1905–14	3·9	1·6
1915–24	3·9	1·5
1925–30	4·2	1·7

This table has been prepared to emphasise the fact that the maternal mortality-rate has not improved during the last 70 years. During this period the introduction of antiseptic and aseptic methods has revolutionised surgery, and the increase of pathological knowledge has reduced to a minimum the previous gigantic death-rates from such diseases as diphtheria and typhoid fever.

Table II. illustrates the stationary maternal mortality figure for the last 20 years as compared with (1) the improvement in the general death-rate; (2) the marked improvement in the infantile death-rate.

TABLE II

Year.	General death-rate.	Infantile mortality-rate.	Total puerperal mortality.	Puerperal sepsis.
1911	14·6	129	3·87	1·43
1912	13·4	95	3·98	1·39
1913	13·8	109	3·96	1·26
1914	14·0	104	4·17	1·55
1915	15·7	106	4·18	1·47
1916	14·3	91	4·12	1·38
1917	14·2	91	3·89	1·31
1918	17·3	98	3·79	1·28
1919	18·5	93	4·37	1·67
1920	12·4	85	4·33	1·81
1921	12·1	81	3·91	1·38
1922	12·8	75	3·81	1·38
1923	11·6	69	3·81	1·30
1924	12·2	74	3·90	1·39
1925	12·2	75	4·08	1·56
1926	11·6	70	4·12	1·60
1927	12·3	70	4·11	1·57
1928	11·7	65	4·42	1·79
1929	13·4	74	4·33	1·80

In order to show how this country stands in comparison with other countries Table III. has been prepared. The comparison is only an accurate one for those countries (italicised) whose figures are for the same period both in length and date.

In order to show how this maternal mortality is made up I have drawn freely upon the report of the Departmental Committee on Maternal Mortality and Morbidity. Its report analysed the histories of 2000 women who had died as a result of childbearing, and found that 1596 deaths were due to this alone, while 404 deaths were due to intercurrent diseases

TABLE III

Countries.	Years.	Per 1000 live births.
Holland	5 (1921–25)	2·4
France	3 (1925–27)	2·5
Denmark	5 (1923–27)	2·6
Italy	5 (1922–26)	2·8
Norway		2·8
Finland		3·1
England and Wales		4·0
Switzerland		4·4
New Zealand	5 (1923–27)	4·8
South Africa		4·9
Germany		5·1
Australia		5·5
Belgium		5·6
U.S.A.	5 (1921–25)	8·3

which may or may not have been aggravated by pregnancy and/or labour. Of the 1596 maternal deaths due to childbearing alone, the cause of death is shown in Table IV.

TABLE IV

		Per cent.
(1) Sepsis	616	38·6
(2) Eclampsia	218	13·6
(3) Other toxæmias	99	6·2
(4) Shock, &c.	145	9·0
(5) Antepartum hæmorrhage.	125 < P.P. 72 / Acc. H. 53	7·8
(6) Postpartum hæmorrhage.	92	5·7
(7) Embolism	113	7·0
(8) Abortion	168	10·5
(9) Ectopic	20	1·2

These 1596 maternal deaths were analysed in another way, with a view to ascertaining whether death was inevitable or might have been avoided in more favourable circumstances. This necessitated the exclusion of all cases of abortion and ectopic gestation (188) and of those cases in which there was insufficient information to form an opinion (122). The remainder are classified under two headings:—

(1) Those in which no departure from established practice was found which had a causal relationship to the death.

(2) Those in which a "primary avoidable factor" was discovered. It was felt that the object of sound and skilful midwifery is to prevent deviation from the normal rather than to treat the abnormal after it has arisen. A "primary avoidable factor" was therefore said to be present when the information in the case-history permitted the discovery of the first point at which such deviation occurred, whether before, during, or after the birth of the child.

In order to make clear what this "primary avoidable factor" means, hypothetical examples may be suggested. For instance, a doctor may discover albumin in the urine and prescribe adequate treatment; the patient may fail to follow his instructions and develop eclampsia. Whether the doctor's treatment of the eclampsia is entirely adequate or not, the "primary avoidable factor" is the failure of the patient to carry out the instructions given, since had she done so eclampsia would presumably not have supervened. Or, again, a woman may die from sepsis following complicated labour; the complication might have been avoided by efficient antenatal care which was not in fact given. The question here is not the efficacy of the method by which the complication was treated in hospital, but the failure of the person, or persons, responsible for the antenatal care to foresee the complication which ended in a difficult delivery, and the "primary avoidable factor" here is inadequate antenatal supervision. It will therefore be seen that the classification has regard only to the primary apparent error in management—i.e., if the patient had a serious pathological condition which

* I should like to acknowledge the free use I have made of the reports of the Departmental Committee on Maternal Mortality and Morbidity in preparing this lecture.—W. G.

ought to have been discovered by antenatal examination, and also an attendant whose management of the case showed departure from established practice, the death is grouped only under the antenatal avoidable condition and not under the mismanagement of labour. Bearing in mind the difficulties of such an analysis, the results are shown in Table V. If these figures are examined it is seen that in 626 cases, 39 per cent. of the total deaths directly due to childbirth, a primary *avoidable* cause was found, while if we exclude Groups 2 and 3 the net percentage of avoidable deaths is as high as 48.

TABLE V

Group.			
1	..	Show "primary avoidable factor" ..	626
2	..	No departure from established practice	660
3	..	Abortion and ectopic, i.e., not strictly relevant	188
4	..	Information insufficient to classify ..	122
			1596

Up to this point I have tried to demonstrate how high our maternal mortality-rate is at present, how it maintains its level in spite of increased medical knowledge, the different causes which go to make up the total, and, most important of all, the fact that in a series of 2000 deaths 626 (31 per cent.) might have been avoided under better conditions. I propose to pass from this review of figures and the depressing side of the subject to the practical aspect of showing you how some of these fatalities can be avoided with consequent reduction in the mortality-rate. How can this be done?

Antenatal supervision is now recognised as an essential part of the care of pregnant women, and yet there are still many women who go through childbearing without this great and invaluable safeguard. It is of interest to note that antenatal supervision was first practised about 40 years ago, but it was not until 20 years later that it became the established practice in lying-in hospitals and maternity departments of the general hospitals.

Abnormal Conditions Preventable by Antenatal Care

What are the abnormal conditions that can be foreseen and possibly prevented by antenatal care?

(1) *Toxæmia.*—I should exaggerate if I said that this condition were entirely preventable, but it is almost so. In those patients who are instructed strictly to avoid constipation and are advised with regard to food and drink, the incidence of toxæmia is at a minimum.

I consider the question of fluid intake in pregnant women of some importance, and always exhort them to drink double the amount of fluid they would take when not pregnant, the best fluid being water. This permits of the easy excretion of the waste products of both mother and child. The idea underlying this homely advice is the adoption for prophylactic purposes of the most efficient therapeutic agent known—viz., water—in the treatment of toxæmia, should it arise. When toxæmia has developed and is recognised, thorough treatment is necessary. Incomplete measures are a source of danger to the patient. By the efficient treatment of albuminuria as soon as it is recognised almost every case of eclampsia can be prevented. There are a few cases of eclampsia, not 5 per cent., which are termed "fulminant" because of the suddenness of their onset without previous symptoms, and the virulence of the toxæmia exhibited. This small group can never be foreseen, nor prevented in the present state of our knowledge.

I do not propose to describe the treatment of toxæmia; this can be found in every text-book, but its recognition I shall deal with in describing the routine antenatal examination later.

(2) *Abnormal labour due to malpresentations.*—By the efficient performance of abdominal palpation in the antenatal routine, the presentation of the child should be made out in practically all pregnant women. Malpresentations are most frequently caused by contracted pelvis, and on every occasion in which an abnormal presentation of the child is met with, in addition to correcting the presentation, it is most necessary to assure oneself that disproportion is not present. There are a few pregnant women in whom the presentation cannot be made out satisfactorily, possibly owing to a thick abdominal wall, a tense uterine wall from over-distension with twins, hydramnios, or malformation of the child. Doubt should not be allowed to exist as to the real position of the child or children in utero, as an X ray photograph of the pregnant uterus will reveal its contents clear in every detail. No patient should be considered too poor, too nervous, or too ill to be X rayed.

(3) *Obstructed labour.*—Whatever the cause of this condition, it should be entirely preventable by the intelligent and efficient performance of the antenatal examination. This entails recognition of the presentation of the child, its correction to a vertex if abnormal; and then the comparison of the size of the fœtal head with that of the pelvis so that one may be certain that there will be room for the head to be driven through the pelvis when the uterus begins to contract.

(4) *Sepsis.*—With a little thought it should be obvious how many instances of this complication can be prevented by antenatal care. It is the most frequent cause of fatalities, as is shown in Table IV., a fact only too well known to those of us who practise midwifery. Sepsis is more likely to be met with in those patients whose labour has been complicated than in normal cases. Antenatal care should prevent obstructed and abnormal labour, in both of which manipulative measures would be called for with consequent increase in the incidence of sepsis. Sepsis is frequently met with in patients possessing foci of infection, and these should be treated and, if possible, cleared up before labour is due.

(5) *Breast sepsis in the puerperium* is usually due to a lack of preparation in pregnancy, and every patient should be instructed how to prepare for the nursing of her child. You may feel that these breast conditions are trivial and rarely serious; I can only tell you that in the Registrar-General's report for 1928 eight women died from "puerperal disease of the breast," and probably not one should have done so.

The Routine Antenatal Examination

When the pregnant woman is first seen, a history should be taken and attention paid to the history of previous pregnancies. We all know the variation in ease and safety which attends the birth of first and subsequent children. Almost all complications are more likely to affect the primipara than the multipara. The details of previous labours, and particularly of stillbirths and abortions, should be obtained if it is possible.

At the first visit a general examination of the patient is necessary. The heart and lungs should be examined, the blood pressure recorded, and a search made for septic foci. The latter group necessitates an examination of the teeth, and in view of the well-known tendency to caries to begin or progress during pregnancy, the mouth should be rendered as clean as possible at an early date. A history of repeated sore-throats requires investigation. Purulent vaginal discharge will be discussed below under the heading of vaginal examination. The recognition and treatment of these foci is important in view of some cases of puerperal infection, even septicæmia, being possibly of autogenous origin. If the patient is anæmic,

as demonstrated by a blood examination, the condition should be remedied by giving iron or, if necessary, a blood transfusion.

Examination of the breasts.—Breast-feeding remains the most satisfactory method for the new-born child. To render nursing as easy and comfortable as it can be made and to avoid infection of the breast as far as possible, the following routine should be carried out.

The nipples should be examined, and if depressed the patient should be taught how to pull them out, to keep them clean by daily washing, after which she should dry them by rough friction. The skin of the nipple and areola should be rubbed with lanoline daily throughout pregnancy, alternating the grease with spirit during the last two months.

Abdominal examination.—The presentation of the child should be determined accurately during the last four weeks of pregnancy; before this date alterations in the position of the child are so common that the presentation may be disregarded. If an abnormal presentation—e.g., a breech—is discovered at the thirty-sixth week its correction should be attempted by external version before the thirty-eighth week. An anæsthetic may render external version possible when it could not otherwise be performed.

The most important single object of the antenatal examination is the recognition of disproportion between the size of the head and the pelvis. Pelvic measurements will help in giving the attendant an idea of the size of the pelvis, but it is not possible to form an opinion of the mechanical course of the labour from them alone.

An attempt should be made to press the head into the pelvic cavity, if it is not already lying there. This is done by grasping the head between the thumb and fingers of one hand, while pressure upon the fundus is exerted by the other hand. Munro Kerr's method can be carried out as follows: The patient lies on her back with her knees raised and separated; the head is grasped by the right hand and pressed into the pelvic brim, two gloved fingers of the left hand are placed in the vagina and appreciate the amount and manner of engagement of the head. This method may be employed without anæsthesia, but more accuracy is obtained when the woman is anæsthetised. If the case is one in which a tight fit is found though the head will press down, the examination should be repeated in a fortnight.

Vaginal examination.—Digital examination of the pelvic cavity possesses an advantage over external pelvic measurements in that an idea can be obtained of the actual space through which the head must pass. In the normal pelvis the promontory of the sacrum cannot be felt, though it can be reached in the flat pelvis. In the generally contracted pelvis the greater part of the sacrum can be felt, but the promontory is usually out of reach. Before the fingers are passed into the vagina, the vulva should be inspected for the presence of sores and purulent discharge. If the latter is discovered suspicion of gonococcal infection will be aroused, particularly if vulvitis and urethritis are present. Gonorrhœa can only be diagnosed by a bacteriological examination of smears of the discharge from both the urethral and cervical canals. In obtaining the latter, care should be taken to avoid contamination of the material from the cervix with pus from the vagina.

Examination of the urine.—It is necessary to test the urine for albumin once a month in the second half of pregnancy and fortnightly in the last month. This regular testing will greatly diminish the incidence of eclampsia, if all patients in whom albumin is discovered are subjected to strict treatment. Indeed, much has already been accomplished; eclampsia is becoming much less frequent. Before treatment is carried out it is necessary to confirm the presence of albumin in a specimen collected by catheter. If albumin is present in a catheter specimen, a microscopic examination should be made to exclude the presence of pus, due to pyelitis or cystitis. The urine should also be examined for sugar, which if present may be lactose or glucose. When the latter is discovered a blood-sugar estimation is necessary; if this is normal the glycosuria can be neglected.

Blood-pressure readings should be taken in all patients at each antenatal visit. Certain American observers believe that the earliest sign of toxæmia is a steady rise in the blood pressure; they even go so far as to neglect examination of the urine for albumin if the blood-pressure reading is normal. I make it my practice, if the pressure reaches 150 and no other symptoms of toxæmia are present, to treat the patient as suffering from toxæmia.

Lastly, a word about the frequency of antenatal examinations. If the woman is well and the urinary examination or blood-pressure reading (whichever you adopt) is satisfactory, it will not be necessary to examine her again after the first visit until the thirty-fourth week, and then at fortnightly intervals until labour begins.

The Principal Causes of Death and their Avoidance

Now if I turn again to Table IV. you will see that I have suggested, and I hope proved to all, that by efficient antenatal care an improvement in maternal mortality can be obtained in the following items of this table: sepsis, toxæmia, shock, and probably embolism. In support of this I may add that at a large London hospital before the practice of antenatal supervision, 23,591 cases were attended with a death-rate of 4·4 per 1000 live births, and after its adoption, 21,425 cases were attended with a death-rate of 1·03 per 1000 live births.

But antenatal supervision is not the only means that can be used to lower these figures, and I propose to deal briefly with each cause of death, outlining methods which will assist us in our struggle for better results.

SEPSIS

This is the commonest cause of death in the child-bearing woman; its incidence can be lessened, as you have been told, by antenatal care, though it is only the smaller part of the group which will be affected by this treatment. The majority of cases arise as the result of some condition, occurring at the time of labour, which could not be foreseen during pregnancy.

Organisms are of course the basic cause of sepsis, but it is generally found that some factor which lowers the patient's resistance is present in the grave or fatal cases. These are: severe hæmorrhage during labour, laceration of the cervix, vagina, or perineum, repeated and unclean manipulations, and exhaustion of the patient from delay in labour. Without the presence of organisms these conditions could not produce sepsis, but organisms are so frequently present in the lower portion of the birth canal, or are implanted by the manipulations called for by difficult labour, that in actual practice sepsis usually follows damage and lowered resistance. Predisposing factors to sepsis are:—

(1) *Contact infection* from patient to patient has almost ceased to exist, compared with 70 years ago, when nearly every case was the result of direct transference of infection. On the other hand, there is evidence to show that a number of cases occur as a result of the spread of infection from the infected air-passages of the attendant, doctor, or nurse.

An excellent article by J. Smith[1] proves this point and draws attention to the necessity of an efficient mask being worn by the person delivering the patient. In the labour ward of this hospital masks are worn by everyone entering the ward if a delivery is in progress.

(2) *Previous puerperal infection* predisposes to infection at a subsequent confinement, and, in addition, the mortality-rate is higher in the secondary attacks.

(3) *Lacerations* are an obvious factor in providing a wound for entry of organisms.

(4) *Manual removal of placenta* is an operation which exposes the patient to the risk of sepsis. It is said to occur after manual removal in between 25 and 42 per cent. (different observers' figures) of cases.

(5) *Induction of labour* under surgical conditions by the introduction of bougies, stomach-tube, or small bags is an operation which is remarkably free from septic complications. Deaths do, however, occur from sepsis following this operation, and it should never be embarked upon without a very definite indication.

(6) *Exploration of the uterus* in the puerperium either before or after the onset of sepsis is an operation attended by the greatest danger. The curette should never be used upon the puerperal uterus whether this is infected or not. Exploration with the gloved finger is only permissible if a piece of placenta has been left behind and is causing severe bleeding. Similarly intra-uterine douching of the puerperal uterus is more dangerous than useful.

(7) *Hæmorrhage* in labour lowers the patient's resistance to organisms and increases the liability to and danger from infection.

The *prevention of sepsis* therefore can be carried out:—

(A) By antenatal care—

(*a*) Prevention of abnormal labour or, if it is inevitable, preparation for it.

(*b*) Cleaning up focal sepsis, throat, teeth, cervicitis, urinary, &c.

(B) In the conduct of labour by—

(*a*) Wearing masks.

(*b*) Avoidance of manipulations as far as possible, and only making a minimum of vaginal examinations.

(*c*) Wearing rubber gloves: this is an important item, as smooth gloves are sterilised so much more easily and completely than the skin of the hand. See experiments of L. Colebrook.[2]

(*d*) Immediate repair of lacerations.

(*e*) Avoidance of induction of labour and exploration of the puerperal uterus.

(*f*) After hæmorrhage, by restoring the patient's resistance by blood transfusion whenever possible.

(*g*) Preparation of vulva and perineum for delivery.

The vulva should be shaved or the hair cut closely. The area should then be thoroughly washed with warm sterilised (chemically) water and soap. The antiseptic chosen to sterilise the water must be one that does not decompose soap, or interfere with the action of iodine, which is to be used subsequently. A very suitable agent is weak iodine solution 1 drachm of a 2 per cent. solution to a pint of water. After drying with a perfectly clean towel, iodine 2 per cent. solution should be painted on the skin of the vulva and perineum and allowed to dry. No attempt whatever should be made to sterilise the vagina or cervix.

(*h*) All instruments should be boiled shortly before use and left in the water, or taken out and wrapped in a sterile towel until required, never being exposed for long.

TOXÆMIA

The prevention and recognition of this condition has been dealt with fully above. I can only reiterate that the fatal cases can be reduced to a tenth of their number by antenatal examination and the adoption of strict treatment as soon as the condition is recognised.

SHOCK

The term "obstetric shock" is one which is used to indicate a condition occurring after parturition similar to that seen after surgical procedures. It is seen most frequently after difficult and prolonged labours and where there has been considerable hæmorrhage, though it is met with where labour has been normal. Certain operations in midwifery definitely predispose to this condition:—

(*a*) Forcible manual dilatation of the cervix previous to extraction.

(*b*) Dragging the child through the undilated cervix with forceps.

(*c*) Manual removal of the placenta after a long labour.

(*d*) Rough and unintelligent attempts to expel the placenta.

It is more likely to occur in women debilitated by hæmorrhage or toxæmia, and after the infliction of serious injuries on the birth canal, apart from the loss of blood usually associated with them. Acidosis predisposes to shock, and when this is present I feel that chloroform as an anæsthetic is dangerous, in that it increases the acidosis and therefore the shock; ether is preferable.

The prevention of shock consists essentially in the *avoidance* of violent measures to achieve delivery, under all circumstances; in a long labour it consists in keeping the patient warm, and in providing her with sleep and a certain amount of easily assimilable food. When she vomits continually much valuable help can be given her by administering rectal salines containing glucose at regular intervals.

Once shock has supervened treatment consists in keeping the patient warm, administering glucose in saline by the rectum, under the skin, or intravenously. Blood transfusion when there has been hæmorrhage. An injection of morphia gr. $\frac{1}{4}$ is always of great use.

ANTEPARTUM HÆMORRHAGE

Neither variety of antepartum hæmorrhage can be prevented or even recognised until the patient begins to bleed. The only way in which the mortality from placenta prævia and accidental hæmorrhage can be diminished is: (1) by the universal appreciation that both are serious conditions, in either of which no patient is safe until her uterus is empty; (2) by similar appreciation that these are conditions in which delivery in home surroundings is not in the interests of the patient, who should be transferred to a nursing-home or hospital as soon as she is fit to be moved. The first symptom is usually a small and sometimes repeated loss of blood. This should serve as a warning and suggest the necessity of putting the patient in the best environment for treatment.

I do not propose to discuss the different methods of treating placenta prævia and accidental hæmorrhage, but to mention some broad principles by which lives can be saved.

No more valuable dictum has ever been uttered than that of Herman in summing up the treatment of placenta prævia, namely, "early version, slow extraction, and antisepsis."

Early version, which should be by the external method, followed by bringing down a leg, because by this one operation alone the bleeding is stopped until the uterus expels the child. It does away with the necessity for further manipulations across the placental site, everyone of which adds to the amount of bleeding and the likelihood of sepsis. *Slow extraction* is imperative, since it lessens

[1] Causation and Source of Infection in Puerperal Fever. Department of Health for Scotland. 1931.

[2] L. Colebrook: Interim Report of Departmental Committee on Maternal Mortality and Morbidity. H.M. Stationery Office. Appendix D. 1930.

shock, avoids the grave danger of tearing the lower uterine segment through the placental site, and allows of treatment to counteract the loss of blood before the actual delivery occurs. *Antisepsis* needs no explanation; of patients suffering from placenta prævia probably more die from sepsis than from bleeding.

In accidental hæmorrhage the patient, in addition to suffering from the effects of hæmorrhage, is also toxæmic. In the treatment of this condition the principles are: to evoke uterine contractions, which being done, never to allow them to pass off until the uterus is empty, and to allow the uterus to empty itself by its own contractions.

I have not mentioned the operation for Cæsarean section which may be a good method in both these conditions. It falls to the lot of few of us to have at our command the surroundings in which it is safe to perform the operation, and the constant practice of abdominal surgery, without both of which the use of this operation would be more dangerous than accouchement forcé.

The means of *counteracting blood loss* include: (1) blood transfusion. This therapeutic measure cannot be too highly valued by anyone who has charge of a maternity department. Of necessity patients requiring Cæsarean section with its sometimes profuse bleeding, and cases of antepartum hæmorrhage are dealt with there. In such women blood transfusion is of inestimable value, both immediately in preventing death from hæmorrhage or shock, and in its later effect by assisting them in their struggle against organisms. I myself am convinced that in those patients who have bled excessively, and who are *not* suffering from infection, blood transfusion will prevent puerperal thrombosis. (2) Saline solution with or without glucose can be given per rectum, subcutaneously into the axillæ, or, in more severe shock, intravenously. (3) Intravenous gum saline solution is of more permanent value than saline solution alone. The addition of a colloid, gum, prevents the too rapid diffusion of the saline solution out of the small blood-vessels into the surrounding tissues.

POSTPARTUM HÆMORRHAGE

Postpartum hæmorrhage is either *primary*, occurring during or immediately after labour, or more rarely *secondary*, which is seen some days afterwards, and is due either to retained products or sepsis. When secondary postpartum hæmorrhage is due to sepsis it is only symptomatic. But when due to retained products, it demands exploration and evacuation of the uterus by the gloved finger under sterile conditions. It should be possible to prevent completely secondary postpartum hæmorrhage from this cause by a careful examination of the placenta and membranes at the end of labour, an essential part of the management of the third stage which must never be omitted.

Primary postpartum hæmorrhage is the more common and more serious. Almost all cases of this severe form are preventable, and fatal cases should be unknown when efficient medical aid is at hand. Their frequency depends upon the manner in which labour is conducted, chiefly in the third stage. A loss of blood amounting to one or even two pints is not very uncommon and not always avoidable.

The *prophylactic* treatment of postpartum hæmorrhage is of great importance. Labour should be properly managed, particularly should the second stage be terminated by forceps delivery, if the uterus shows signs of becoming exhausted. During the third stage the uterus should be properly held, so that undue relaxation and distension can be appreciated as early as they occur. If bleeding does occur it is important to stop it as soon as possible. At every labour the appliances used in the prevention of bleeding must be available for use at a moment's notice—a hypodermic syringe, sterile and loaded with Pituitrin or Femergen, a douche can and sterilised intra-uterine douche nozzle, also plenty of hot boiled water.

Postpartum hæmorrhage may occur from lacerations, very occasionally the result of normal labour, more commonly caused by instrumental delivery.

A tear of the cervix is the most common site from which such bleeding comes. The fact that the bleeding begins at the birth of the child, continues at the same rate and in the presence of a well-retracted uterus, enables its cause to be recognised without any doubt. The ideal treatment is immediate suture of the laceration, but if this is not possible a hot douche, followed by packing the tear with sterile gauze, will stop the bleeding.

In all cases of hæmorrhage in connexion with labour, it is striking how well women will stand a considerable loss of blood. But, on the other hand, it cannot be too widely realised that a second hæmorrhage, however small, has effects out of all proportion to its amount. For this reason, the methods of counteracting blood loss should be carried out without delay in all patients who have bled profusely.

EMBOLISM

I feel sure that the majority of deaths from this cause must have been in septic cases and that sepsis was the cause of the pathological changes which led up to the fatal result. A few patients develop thrombosis and subsequent embolism as an after-result of excessive bleeding, and a very few in whom no cause can be found. In the septic group the prevention of embolism can be achieved by the prevention of sepsis. In that class which follows hæmorrhage I have in my ward here reduced the incidence of thrombosis and embolism to a minimum, by the routine use of blood transfusion, in all patients whose red cell count is below 2½ million, and whose hæmoglobin is less than 55 per cent.

The Primary Avoidable Factor Analysed

I hope that I have given sufficient details to show how the different causes of death in Table IV. are almost entirely capable of prevention, or if they occur can be treated so as to avoid a fatal termination. I should like to go back to an earlier part of the lecture where I told you that in the analysis of 2000 maternal deaths 626 were considered to be avoidable. These 626 cases all presented a primary avoidable factor which was analysed and put into four groups (see Table VI.).

TABLE VI

	Deaths.
(1) Omission or inadequacy of antenatal examination	226
(2) Error of judgment in management of case ..	224
(3) Lack of reasonable facilities	64
(4) Negligence of the patient or her friends ..	112

These groups must be considered separately:—

(1) *Omission or inadequacy of antenatal examination* (226 deaths).—In this group it was found that the person responsible for the patient had made no antenatal examination whatever, or had been denied the opportunity to do so by the patient in 157 cases. In the remaining 69 cases antenatal examination was carried out, but a gross abnormality which must have been present was not detected.

This large proportion, nearly 70 per cent., of patients in whom antenatal treatment was lacking entirely, refers only to the cases in which it was considered

to be the avoidable factor leading to the fatality. There were many more cases in the total 2000, but naturally the percentage would be lower. It seems to me that no one here can have the least doubt that antenatal care presents a readily available means of reducing maternal mortality.

(2) *Errors of judgment* (224 deaths).—In any group of cases the responsibility for such errors will always be seen to rest more on the doctor than on the midwife. This is due to the fact that the latter can and does pass her responsibility on to the doctor, but he, unhappy man, has always to make the decision as to the method of treatment. Those of us who practise obstetrics are only human, and errors of judgment are bound to occur at times. I have tried to present to you main principles in the management of labour, both normal and abnormal, by which a considerable number of these errors can be avoided.

(3) *Lack of reasonable facilities* (64 deaths).—In this group are included cases in which no skilled assistance was available, possibly because the patients lived in very remote country districts, labour taking place in unsuitable surroundings. Occasionally the most luxurious bedroom may be as unsuitable as the filthiest cottage. There is no doubt that labour in a nursing-home or hospital is safest for the patient.

(4) *Negligence of the patient or her friends* (112 deaths).—This usually takes the form of failing to follow the doctor's advice, or ignoring symptoms and signs of grave illness. In all cases there is an absence of the necessary coöperation on the part of the patient.

Conclusion

But whatever its cause the two following groups of figures prove that the maternal mortality-rate can be lowered :—

(1) *General Lying-in Hospital, Lambeth.*—Ten years, 1920–29, hospital and district cases—25,906. Mortality-rate 1·31 per 1000 births.

(2) *Queen's Nurses.*—For year 1928, all district work —65,077 cases. Mortality-rate 1·9 per 1000 births.

I trust that I have convinced you that the present high maternal mortality can be lowered, and that this achievement lies in the hands of doctors, students, and nurses.

W. GILLIATT, M.D. Lond., F.R.C.S. Eng.
Obstetric and Gynæcological Surgeon, King's College Hospital; and Surgeon, Samaritan Hospital.

POST-GRADUATE LECTURES

THE notes which follow are summaries of addresses delivered at the London Hospital (Dr. Wall and Dr. Tallermann) and at Westminster Hospital (Mr. Cade). The addresses formed part of the autumn courses arranged by these hospitals for their former students.

SOME MEDICAL COMPLICATIONS OF PREGNANCY

(DR. CECIL WALL)

I PROPOSE to-day to discuss certain complications of pregnancy in which, in hospitals, the physician's aid is usually sought by the obstetrician. In general practice, where you play the double rôle, these complications may at times give you great anxiety.

I will begin with *pulmonary tuberculosis*, and will take as a text the case of a woman whom I have watched for the past three years.

She was a young woman, 25 years of age and recently married, when in October, 1930, being two months pregnant, she attended another hospital and was found to be suffering from pulmonary tuberculosis. The advice given was that the pregnancy should be terminated and that at the same time she should be sterilised. She refused the sterilisation but consented to the abortion which was effected by a tent. She was then transferred to the Brompton Hospital and came under my care. I found slight tuberculous infiltration at the apex of one lung; evidence of activity of the disease soon disappeared and she was transferred to Frimley; she went through the usual course of graded exercise and was discharged in March, 1931, with the disease arrested.

In the following July she was found to be pregnant again but refused to have the pregnancy interrupted. In January, 1932, she was delivered by Cæsarean section at the hospital at which she had attended first. She nursed the baby until May, both keeping well. She became pregnant again in November, 1932, and on going to a third hospital was persuaded to submit to Cæsarean section again at about the twenty-fourth week, and agreed to sterilisation. I heard of her last in June of this year. Both she and her child were then well.

Taking the incidents in order, I think that the advice given at first to terminate the pregnancy was good, but that she was wise to refuse sterilisation. Pregnancy itself does not affect the prognosis of pulmonary tuberculosis. My own experience is fully in accord with the recent statistical literature bearing on the problem. There are, however, certain practical difficulties in the management of the treatment of the tuberculosis if pregnancy coexists. Chest hospitals and sanatoria find difficulty in admitting pregnant women, and lying-in hospitals have not facilities for dealing with tuberculosis. Furthermore, common experience shows that the risk of recrudescence of the disease as the result of physical overstrain does not cease to be appreciable until at least two years have elapsed without recurrence of symptoms. Labour, lactation, and the care of the child all mean considerable physical strain; consequently the advice in this case that the pregnancy should be terminated in its early stage was sound and the method adopted was good. Hysterotomy and sterilisation in my opinion were contra-indicated; even a slight cutting operation when the tuberculosis has been active recently may give rise to an exacerbation and involves more risk than induction by a sound or tent. Undue pessimism with regard to the prognosis in pulmonary tuberculosis led to the advice that this woman should be sterilised.

If the pregnancy had been further advanced when the tuberculosis was recognised the advice might, I suggest, have been different; after the twentieth week the termination of the pregnancy artificially is associated with greater risk than allowing it to continue. Associated pregnancy does not alter the prognosis of the tuberculosis or contra-indicate the approved methods of treatment by artificial pneumothorax, sanocrysin, and the like. Labour at term undoubtedly may lead to an exacerbation of the disease, but unless there are obstetric complications it seems to involve less risk than operative procedures in advanced pregnancy.

The second pregnancy in July, 1931, so soon after discharge from the sanatorium was undesirable, and it would have been safer for her to take the advice to have it ended; however, she decided to allow the gestation to continue, and submitted to Cæsarean section at about the twenty-sixth week with satisfactory results both to her and to the child. In the absence of any obstetric complications it is difficult to understand why nature was not allowed to pursue

its normal course. I know that modern surgery has reduced almost to the vanishing point the risk of abdominal operations, but as we came together to this theatre Mr. R. A. Brews confirmed my opinion that the fatigue after a natural labour disappears in a few hours, whereas the after-effects of Cæsarean section may not have disappeared in a week. Fatigue is always dangerous to a tuberculous person, and this should be borne in mind when advising the mode of delivery of a tuberculous woman. In the case I quote the result was happy, but I cannot help thinking that natural labour would have involved less risk than Cæsarean section.

The third pregnancy was recognised in November, 1932, but was allowed to continue until well advanced and then terminated by a second Cæsarean section before the child was viable, though there was no evidence of recrudescence of the tuberculosis; at the same time the patient was sterilised. I must confess my doubts as to the wisdom of this treatment; two years had elapsed since the woman was discharged from Frimley, and she had not relapsed in spite of the strain to which she had been submitted. Natural labour at term would have been less exhausting than an abdominal operation, and less drastic measures than sterilisation might have been adopted to prevent future pregnancies.

I have spent some time in discussing tuberculosis and pregnancy, but would like to draw your attention briefly to some other medical complications with which you may have to deal. A good many years ago Dr. Russell Andrews and I showed by statistics that it was unwise to interfere with the pregnancy of a *choreic* patient, and that the treatment of the chorea satisfied the requirements of the case. Since then many observers have shown that pregnancy associated with *morbus cordis* should generally be allowed to pursue a natural course; the child is usually small and the labour easy.

Dr. Eric Skipper has shown in his paper in the last number of the *Quarterly Journal of Medicine* that in *diabetics* pregnancy may be allowed to pursue a normal course if treatment by insulin is provided.

VOMITING AND COLIC IN EARLY INFANCY

(DR. KENNETH TALLERMAN)

VOMITING and colic are so common in young infants that they demand serious consideration. They are both, however, only symptoms, and not diseases in themselves; on this account the underlying cause must always be sought. Although one sometimes thinks of colic as meaning pain in the stomach, it may actually be pain arising from various intra-abdominal conditions.

The causes of vomiting and colic in infants may conveniently be divided into those due to mismanagement and dietary disorders, and those due to true organic disease. The former group are by far the more frequently met with. Among these one must first place *underfeeding*. Here, in addition to true colic, there is restlessness, inability to sleep properly, marked loss of weight, and frequently diarrhœa characterised by the passage of so-called "hunger stools." Such stools are small, very dark green in colour, and mixed with a little mucus. In the case of breast-fed infants, the diagnosis can be clinched by carrying out a *series* of test feeds, and noting the average amount taken by the infant; it is a mistake to place reliance on a single test feed, since the quantity of milk obtained by any infant varies at the different feedings throughout the day. With the artificially fed child, a consideration of its total food intake, in relation to its age and weight, should always give the required information as to whether it is being underfed. Treatment consists, on the one hand, in complementing the breast milk, and, on the other hand, in increasing the amount of artificial food. It is a grave mistake to substitute a bottle feed for a breast feed in the case of an underfed breast-fed infant, since the secretion of breast milk can be increased only by adequate stimulation, and the omission of a breast feed obviously reduces this stimulation. The artificially fed baby is not infrequently given feeds too large in volume and too dilute; for this reason the child is under-nourished and loses weight. As a result it suffers from restlessness and screaming attacks, and at the same time it is made uncomfortable, and vomiting is induced, by the large bulk of each feed, consisting mostly of water. It is often forgotten that no matter how large the feed, its caloric value is entirely dependent upon the concentration of the mixture used, and an infant may easily be distended with fluid and at the same time grossly underfed. From this point of view dried milks are of especial value, since they can be given in full strength (1 drachm of milk powder to 1 oz. of water) after the early days of life, thus providing in relatively small bulk a feed of high caloric value, which forms in the infant's stomach a fine flocculent curd similar to that of breast milk. It is the size and toughness of the curd formed from fresh cow's milk, and not the high protein content, per se, that is chiefly responsible for the digestive disturbances it causes when given to young infants. The fear of giving an infant too high a protein content in milk mixtures is nothing but a bogy.

The next common cause of vomiting and colic is *overfeeding*. Here the child presents marked signs of discomfort in addition to the other symptoms, and there is a rapid gain in weight, sometimes accompanied by diarrhœa. Here again diagnosis depends upon a consideration of the infant's actual intake as compared with its food requirement. The treatment in such cases is to cut down the number of feedings, or to decrease the actual food intake at each feeding. Overfeeding in breast-fed infants is very common, and the mother often inadvertently makes matters worse by acting on the assumption that the child is hungry, and therefore feeding it more frequently, or even actually putting it to the breast every time it cries.

Air-swallowing is a further cause of vomiting and colic. This occurs in infants who feed too rapidly, and in breast-fed infants is sometimes associated with underfeeding; here it results from the child's sucking at an empty breast, and automatically swallowing air as it sucks.

In regard to *organic disease*, these two symptoms are notably present in pyloric stenosis. They occur sometimes also in pyelitis, and in intussusception colic is of course an outstanding symptom. In such organic diseases one naturally finds, besides these important symptoms, the other symptoms and the physical signs typical of the disease in question. So far as pyloric stenosis is concerned, a degree of gastritis almost always exists, and stomach washing should be used for a few days prior to operation if such a procedure is decided upon; it also forms an important part of medical treatment. Owing to persistent vomiting these infants suffer from varying degrees of alkalosis, and therefore the stomach should be always washed out with saline and *not* with sodium bicarbonate solution. Pyelitis in infants should be treated by the use of alkalis in sufficient dosage to keep the urine alkaline throughout the whole 24 hours.

The treatment of intussusception is surgical, and operation should be carried out as soon as possible after the diagnosis has been established.

DYSPHAGIA

(MR. STANFORD CADE)

I AM concerned in this lecture with some practical considerations of the common conditions producing dysphagia. From an academic point of view it is no doubt interesting to argue whether some case of difficulty in swallowing is due to spasm of a sphincter or to failure of relaxation of the same sphincter; from the practical point of view it matters chiefly to discover whether the difficulty in swallowing is due to a malignant growth or to some other cause. The only way of differentiating the various cases is by submitting them all to a complete investigation at the earliest possible moment. Age, sex, mode of onset should not be used as an excuse to postpone investigation. In cases of dysphagia there is no justification for "expectant" treatment. The erroneous impression gained from the literature that dysphagia is not uncommonly due to spasm, aneurysm, cicatricial contraction, or diverticula is due to the fact that such cases are often reported, being interesting and presenting some special feature. In reality they do not account for more than 6 to 8 per cent. of all cases, the vast majority being due to a malignant growth. This being the case it is of the greatest importance not to delay diagnosis.

A systematic investigation should consist of the following steps:—

1. *History of the case.*—This should be taken in detail; it will throw a great deal of light on the case. Direct inquiry should be made for trauma, foreign bodies, burns. A statement by the patient that dysphagia has been present for years, that it is intermittent, that it occurred often under emotional strain or with certain foods only should not be allowed to detract attention from the graver possibilities and must not encourage the practitioner to prescribe belladonna and hope for the best. It must be remembered that a long history of slight or intermittent dysphagia does not infrequently precede the development of a neoplasm and that the "text-book picture" of fairly rapid and relentlessly progressive difficulty in swallowing is not always obtained. With equal caution must be received the statement that dysphagia occurred as "a bolt from the blue" in the middle of a meal and the first indication was sudden but complete and temporary inability to swallow. Direct inquiry should be made about: (*a*) vomiting, its quality, quantity, and relation to swallowing; (*b*) increased salivation and presence of mucus in the throat; (*c*) occasional streaks of blood in the sputum; (*d*) change of voice, however slight.

A carefully obtained history often helps to establish a diagnosis of the rarer causes of dysphagia, but it must never be forgotten that by far the commonest cause is a malignant growth somewhere between the pharynx and the cardia and deliberate search is to be made for it.

2. *Clinical examination* should consist in a systematic examination of the mouth, pharynx, and larynx. The lateral walls of the pharynx, the pyriform fossæ, and upper aperture of the larynx should be scrutinised. A pool of mucus behind the arytenoids, or frothy saliva in one pyriform fossa should arouse the gravest suspicion. The presence of œdema or an ulcer make the diagnosis nearly a certainty. A routine examination of the neck, chest, and abdomen should always follow. And lastly, the patient should be given a tumbler of water and swallowing observed.

The accidental discovery of an unsuspected lesion elsewhere should not deter one from a complete examination. The greatest injustice to the patient is a diagnosis of "functional" dysphagia without the fullest possible examination.

3. *X ray examination* should consist of: (*a*) A preliminary skiagraphy of the chest with special attention to the mediastinum. (*b*) Screening of the œsophagus with an opaque meal of fluid, semisolid and thick barium. The clinician interested in the welfare of his patient will be present at this examination. The meal should be visualised from the mouth down to the stomach both in the antero-posterior and oblique positions. (*c*) Films should be taken as they may reveal beyond the actual narrowing of the lumen of the œsophagus, extramural extension of the disease, its size and position.

4. *Œsophagoscopy.*—In careful hands this is a minor procedure. It should never be omitted; it should follow and not precede X ray examination, and it can give details of the type, size, and extent of the lesion unobtainable by other methods of examination.

The three following points require emphasis: (*a*) Bougies are dangerous and of doubtful usefulness, and should never be used unless under direct vision through the œsophagoscope. (*b*) A positive Wassermann reaction does not signify that the patient is free from all other diseases and time must not be wasted in protracted antisyphilitic treatment. (*c*) A negative result of a biopsy is of little value and should not outweigh clinical evidence.

Success or failure of treatment depends upon early diagnosis. If the lesion is benign, appropriate surgical treatment gives satisfactory results. Early diagnosis offers the only hope in malignant cases. The pharynx offers possibilities for the exercise of surgical skill in a minority of cases. Radiation by radium or X rays is applicable to a larger group of cases and by modern methods has given encouraging results. The œsophagus is still the realm of experimental surgery and for all practical purposes beyond the range of successful radiation.

THE SERVICES

ARMY MEDICAL SERVICES

Col. H. R. Bateman, late R.A.M.C., having attained the age for retirement, is placed on retd. pay.

Lt.-Col. J. P. Lynch, from R.A.M.C., to be Col.

ROYAL ARMY MEDICAL CORPS

Maj. J. W. Lane to be Lt.-Col.

TERRITORIAL ARMY

Lt. G. Lyon-Smith to be Capt.

F. A. Edwards (late Cadet Serjt., Dulwich Coll. Contgt., Jun. Div., O.T.C.) to be Lt.

L. F. O'Shaughnessy to be Lt.

Supernumerary for service with O.T.C.—Lt. S. Andrews to be Capt. supern., for serv. with Med. Unit, Queen's Univ., Belfast Contgt., Sen. Div., O.T.C.

INDIAN MEDICAL SERVICE

Lt.-Col. R. T. Wells retires.

Lt. P. L. O'Neill to be Capt.

Lt. F. W. Whiteman is restd. to the establmt.

ROYAL AIR FORCE

Flying Officer J. F. Sandow is granted a permanent commission in this rank.

MEDICINE IN THE DEFENCE SERVICES

THE Committee set up by the Government in 1931, under the chairmanship of Sir Warren Fisher, to investigate the causes of the shortage of officers and nurses in the medical and dental branches of the Navy, Army, and Air Force medical services, issued their report at the end of last July (see THE LANCET, August 5th, 1933, p. 298). The general conclusions of the report pointed to the necessity for improving the medical career in these services materially, and the Committee were assisted to their conclusions by all the Government departments concerned, by many responsible officials, by evidence from the medical schools, and by representation from the British Medical Association.

The Naval and Military Committee of the Association have now made a series of statements upon the Warren Fisher report, and these appeared as a supplement to the *Brit. Med. Jour.* last week. This has been done in response to an instruction from the Representative Body to the Council of the Association that the Council should consider the report and the action of the Government arising thereout, and that, if such action should appear unsatisfactory, the Council should be "given full authority to advise members of the profession seriously to consider the disadvantages to which they are liable if they accept service." The statements of the Naval and Military Committee have been forwarded as a memorandum to the Admiralty, the War Office, and the Air Ministry, and the Council of the Association propose to define the attitude of the Association in the light of the replies received.

With regard to all three Services the statements are arranged upon the same plan and are often verbatim similar. The Committee agree with the reduction of the establishment in the Naval Medical Service to meet present requirements, but point out that an adequate number of supernumerary medical officers will be necessary to relieve established officers; they recommend such officers to be attached to flag-ships as substitutes for medical officers serving with the fleets. In regard to the Army and the Air Force the reductions are viewed with apprehension. The Committee welcome the proposals for up-grading in all three Services and with regard to pay, hold that the minimum rate should be that which existed before the 3 per cent. reduction at the time of the national emergency, and find that the possibility of further reductions of pay is a constant grievance to the serving officers and a strong deterrent to recruiting.

Two paragraphs in the Warren Fisher report dealing with lack of economic attraction are adversely commented upon in respect of all three Services in practically the same words. They are as follows:—

(Par. 22): "In examining the financial value of the career it is not sufficient to consider the scale of emoluments; it is necessary to take into account the length of the career, the average ages at which promotion takes place, and the proportion of officers that can be promoted from rank to rank. The financial value of the career is a function of all these factors and in order to estimate the economic attraction of the career, account must further be taken of factors which cannot be precisely expressed in terms of money, namely, amenities of location and accommodation, frequency of moves, and the liability of an officer to be separated from his family."

(Par. 23): "The age of entry into the three Services is taken to be 25. Promotion is automatic after a special number of years service so far as the rank of Commander in the Navy, Major in the Army, and Squadron-Leader in the Air Force; above those ranks it is by selection within establishment. Assuming a rate of wastage (i.e., of premature exit from all causes) of 4 per cent. per annum, a figure based upon the Admiralty's experience, the establishments of the services as at present organised would in normal circumstances—present conditions are in many ways abnormal—allow of promotion as follows: (Tabular statement here shows ages of promotion and proportion of officers promoted.)

Upon these paragraphs the statements by the Naval and Military Committee, in the form of a note, are as follows, with certain alterations in phraseology to fit the particular Service alluded to:—

"The financial value of the career, based upon the ages at which the average man may expect to secure promotion, is estimated in the Warren Fisher Committee's report on the assumption of a certain rate of wastage—4 per cent. This rate depends, to some extent, on the degree of satisfaction with which the terms and conditions of service are viewed by serving officers. The present rate of 4 per cent. results, over a period of years, in a high total wastage, and the statement that 44 per cent. of surgeon-commanders are promoted to be surgeon-captains is apt to be misunderstood unless it is realised, as it is stated later in para. 23, that the 44 per cent. mentioned is of surgeon-commanders still in the Service and eligible for promotion—that is, 44 per cent. of 7½ per cent., which is understood to be the percentage of entrants remaining at this stage. Stated as a proportion of entrants, this figure would be approximately 3½ per cent.

"As these calculations are based on accumulated wastage, so the Committee's estimate of ages and promotion and proportion promoted under the complete scheme envisaged by the Warren Fisher Committee is based on the existing rate of wastage. Should the rate of wastage decline—and this might be held to be one of the objects of the Committee's proposals—then the basis of the calculations will be seriously affected, and the estimate that 75 per cent. of surgeon-commanders, serving and available, will be promoted to be surgeon-captains may be undermined. The present statement that 44 per cent. of officers reach the rank of surgeon-captain means that approximately 3½ per cent. of *entrants* reach this rank. The statement that 75 per cent. of officers will reach the rank of surgeon-captain means that approximately 5 per cent. of entrants will reach the rank of surgeon-captain (at the same rate of wastage). Any decrease in the rate of wastage will lower both these percentages."

With regard to all three Services the short-service system, though its power of attraction is acknowledged, is condemned.

Royal Army Medical Corps.—In regard to this Service the Committee welcomes the proposals to increase the number of posts carrying specialist emoluments, but on the subject of charge pay it is pointed out that the duties of the medical officer are preventive as well as curative and that to estimate charge pay in proportion to the sick persons under the officer's care is a misconception of his functions. The Committee emphasises strongly the view that the maximum rates of retired pay to be earned by officers of the rank of Major, Lieut.-Colonel, and Colonel are inadequate, while they affirm the opinion expressed by the Association before the Warren Fisher Committee that the head of the Medical Services should have a seat on the Army Council. The Committee criticises the statement of the Warren Fisher Committee as to the annual cost by the medical services of the Army, believing the figures to have been arrived at by including under this heading expenses which should have been set down elsewhere.

The statement with regard to the Royal Army Medical Corps ends with the following note on the application of the proposals of the Warren Fisher Committee to existing officers:—

"The increase in the number of lieut.-colonelcies, if immediately adopted, will do a good deal to remedy the grievance of the large number of majors awaiting

promotion, but the Committee reaffirms its belief that the proper solution of the problem lies in promotion to the rank of lieut.-colonel on a 'years of service' basis, or alternatively that majors of 22 years' service and selected for promotion should receive the pay and retired pay of a lieut.-colonel whether actually promoted or not. The rate and method of application of the proposals of the Warren Fisher Committee to existing officers is of vital importance to the Service, and it is considered that they should be determined—and the application commenced—with the least possible delay."

Royal Air Force Medical Service.—In regard to this Service the Naval and Military Committee, while welcoming the proposals for upgrading and lengthening the career, ask for a definition from the Air Ministry of the specialisation found necessary in the Service.

HONORARY SURGEON TO THE KING

Maj.-Gen. J. F. Martin, C.M.G., C.B.E., late R.A.M.C., V.H.S., has been appointed Hon. Surgeon to The King, vice Maj.-Gen. W. H. S. Nickerson, V.C., C.B., C.M.G., late R.A.M.C., who has retired.

SPECIAL ARTICLES

PROTECTION FROM X RAYS AND RADIUM

IN June, 1932, it was announced that the X Ray and Radium Protection Committee was making an inquiry into the blood changes occurring in workers in radiological departments. A questionnaire was issued to hospitals, the authorities being asked to state how many workers in the X ray or radiological departments were being subjected to periodic blood examinations, and in how many of these, if any, alterations of the blood had been found. They were asked to supply also details of the workers' occupation, duration of service, and results of treatment. Sir Humphry Rolleston, chairman of the Committee, had previously [1] drawn attention to the conflicting observations made in blood changes following irradiation, which it was hoped the evidence to be collected would help to resolve. The brevity of the Committee's report (set out below) on the data submitted suggests that it was not adequate for this purpose, and the Committee has confined itself to emphasising the desirability of excluding from contact with radium and X rays persons with a leucopenia and of keeping a watch on the blood counts of workers in radiological departments.

The Committee's Report

At a recent meeting of the X Ray and Radium Protection Committee, presided over by the chairman, Sir Humphry Rolleston, it was decided, in view of fresh evidence available, to reaffirm the attitude of the Committee upon the necessity or otherwise of periodic blood counts on those engaged in radiological work. Particular importance centres round this matter, for if on the one hand the performance of these blood counts means a burden on hospital departments, from which they would welcome relief, yet on the other hand it is now generally acknowledged that changes in the blood picture due to radiation are recognisable long before any serious damage is likely to have been caused. It is in fact a danger signal, the indications of which cannot lightly be disregarded.

RECOMMENDATIONS

1. No person should be employed as an X ray or radium worker whose blood (as tested by a complete blood count) or general health is unsatisfactory.

2. Before beginning work or training, the normal leucocyte level should be found. If none of the total counts reach 6000 per c.mm. and none of the lymphocyte counts reach 1200 per c.mm., the service of the worker should not be accepted.

3. Periodical total and differential blood counts of the worker should be made during the morning period, every 6 months in the case of the X ray worker and every 3 months in the case of the radium worker. (With regard to this recommendation the Committee suggest that the six-month period may be considerably extended in the case of X ray workers in departments which otherwise comply with the recommendations of the Committee.)

4. If then there is found to be a decided and sustained drop in the total leucocyte or lymphocyte count the worker should cease work and be placed under treatment for an adequate period. On resumption of work every care should be taken and the circumstances of the work should be reviewed so as to prevent a recurrence.

APPENDIX TO THE REPORT

It is not possible to lay down hard-and-fast rules for the detection of what may or may not be considered a pathological change in the blood, owing to the physiological alteration of the number of the cells which is always taking place. A leucopenia is the first blood change to occur in X ray and radium workers. In order to detect this change at an early stage, it is necessary to take into account the following facts with regard to the leucocyte content of the blood of normal persons. A leucocyte tide occurs twice daily in all healthy individuals; that which occurs in the day time is low in the morning and high in the afternoon, particularly between 3 and 4. The differences between morning and afternoon counts are not infrequently twofold. Superimposed on this are minor fluctuations which can be detected at short intervals of time—e.g., minutes. Furthermore, when counts are made over long periods of time, such as a month, then the variations of the total leucocyte may be as wide as fourfold. It is to be noted that the polymorphonuclear cells play the dominant part in all these variations, and that the different varieties of white cells vary independently. In face of these wide variations, the leucocyte level of an individual can only be determined on the basis of a number of counts. Three afternoon counts on the X ray and radium worker should be made before beginning his work or training. Afternoon counts should be chosen, since the afternoon rise in the numbers of white cells is less pronounced in leucopenia than normally. A mild leucopenia can thus be detected without difficulty. When the subsequent routine counts are made, a single afternoon count, if satisfactory, is sufficient. If on the other hand it is decidedly lower than the level normal to the individual, and this is confirmed by two further afternoon counts, then a full investigation of the case is essential.

This report reaches us signed by the honorary secretaries, Dr. Stanley Melville and Prof. Sidney Russ.

It will be noticed that there is a discrepancy in detail between Recommendation 3 and the appendix, in respect of the time (morning or afternoon) at which blood counts should be performed.

[1] Quart. Jour. Med., 1930–31, xxiv., 101.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

EDINBURGH UNIVERSITY

THE celebration of the 350th year of the University has reminded Scotland that, in the founding of the "Tounis College," Edinburgh Town Council has a unique place in Scottish history. At the reception by Lord Provost Thomson and the Lady Provost, over 1000 guests filed past. The Lord Provost sketched the growth upwards of the university from "two classes with one master in 1583" to its present position with 4000 students—men and women—in 1933. Sir James Barrie, the chancellor, created the atmosphere always associated with his character. This was most obvious when Miss Frances Helen Simson, M.A., the first woman graduate of the university, came forward to receive her honorary degree. The chancellor assisted her on to the dais and, after the promoter had sketched her distinctions and the capping ceremony had been performed, led her on his arm back to her seat far down the aisle. Sir James Crichton-Browne, the doyen among Edinburgh medical graduates, had a great reception. He went to the university when he was 17 and he is now 92. He sprang alertly to his name and walked up with a swing to be received with both hands by the chancellor, who, as a former pupil of Dumfries Academy, was an old friend.

A NEW WORKING MEN'S COLLEGE

Almost on the site of the original university buildings—"Kirk-o'-Field"—there is now a house to be devoted to the purposes of a Working Men's College. This college is the gift of Prof. Wilkie, professor of surgery. The donor's name was not announced until the day of the opening (Saturday, Oct. 28th). Prof. Wilkie, like Sir James Barrie, is a native of Kirriemuir (Thrums) and they are intimate friends. Sir James opened the new premises with his usual felicity. The college is a happy reminder of the close relation between medicine, in the broad sense, and the social education of the working man. Prof. Wilkie, in the evening, made a wireless appeal for the new college. He deserves the thanks of all concerned with adult education.

IRELAND

(FROM OUR OWN CORRESPONDENTS)

RESIGNATION OF SIR JOHN MOORE

WITH the beginning of the winter session Sir John William Moore has retired from two offices which he has long filled with distinction—that of physician to the Meath Hospital and that of representative of the Royal College of Physicians of Ireland on the General Medical Council. He was appointed to the staff of the Meath in 1875 in immediate succession to the world-famous William Stokes, who had himself been appointed in 1826. The double tenure, therefore, covers a period of 107 years. Sir John Moore has been a member of the General Medical Council since 1903. This office, like membership of the staff of the Meath, appears to confer longevity, for since the passing of the Medical Act of 1858 there have been only three representatives of the Irish college—Aquilla Smith, who held office from 1858 to 1889; Lombe Atthill, who held office from that date to 1903; and Sir John Moore himself. Dr. T. G. Moorhead has now been appointed to succeed him. The offices mentioned have been far from exhausting the activities of Sir John. He has been a pioneer in the applications of preventive medicine; he has been an agitator for reform in health administration; he has served the Royal College of Physicians not only as stated above but as registrar and president; he has been president of the Royal Academy of Medicine in Ireland. In fact, for over fifty years past he has been at the heart of every medical activity in Dublin. At the opening of the winter session at the Meath Hospital Sir John Moore was presented by his late colleagues at the hospital with a silver salver as a token of their respect and affection. Although Sir John has thought fit to divest himself of some of his responsibilities, his friends rejoice to know that he is still active in mind and body, and they wish him long life to enjoy that blend of leisure and work which will best satisfy him.

THE IRISH HOSPITALS SWEEPSTAKES

The draw in the tenth sweepstake in aid of the Irish hospitals took place from Oct. 21st to 24th. In opening the draw, Lord Powerscourt, chairman of the Hospitals Committee, stated that the total receipts amounted to £2,726,628. A net sum of £448,771 will be transferred to the hospital fund. From the ten sweepstakes the sum which has been or will be available for hospitals is about five millions. Lord Powerscourt emphasised the fact that this sum, large as it seems, is by no means adequate to do all that is needed. While many overdrafts have been cleared off, and much equipment provided, the principle of endowment is only beginning to be considered. On a previous occasion Lord Powerscourt spoke of a total of twelve millions as being required to put the hospitals in good condition and render their future secure.

A NEW BELFAST HOSPITAL

An important event in hospital development in Northern Ireland took place on Oct. 21st, when Mrs. Stanley Baldwin formally opened the new Royal Maternity Hospital at Belfast. The new building replaces the older one in Townsend-street and has accommodation for 100 patients. The site is well chosen, well away from the noise of street traffic and set in behind the Royal Victoria (general hospital) and the Belfast Hospital for Sick Children. The equipment is modern and the interior structure arranged along the lines of similar new institutions at home and abroad. It is built in the form of a central administrative block with east and west wings on three floors. There is a large antenatal department equipped with dressing cubicles, and the wards are of ten to twelve beds with some smaller rooms. Arrangements have also been made for the accommodation and teaching of students. There is a good common room, lecture theatre, and museum. The opening of this building completes the immediate plans for hospital development which have been pursued in the past ten years. The names of the late Prof. J. A. Lindsay, Prof. C. G. Lowry (midwifery), and Prof. R. J. Johnstone (gynæcology) were mentioned in the course of the speeches as having taken a leading part in the arrangements for the building of the hospital.

TRAINING FOR NURSES.—A preliminary training school for nurses has been opened at the Western Infirmary, Glasgow. Probationer nurses will receive two months' instruction in the school before joining the staff of the infirmary.

THE LONDON MEDICAL EXHIBITION

(*Concluded from p. 1007*)

Food and Drinks

(93) BOVRIL, LTD. (148–166, Old-street, E.C.), reminded practitioners of their well-known beef extract in its various forms.—(84) BRAND AND CO., LTD. (Mayfair Works, Vauxhall, S.W.), showed their invalid food specialties, including meat juice, beef and chicken essences, and calves' foot jelly; also Peptamalt, a highly concentrated, predigested, liquid food prepared from beef and barley malt.—(100, 101) CADBURY BROS., LTD. (Bournville), displayed nourishing drinks and chocolates, and dispensed their Bourn-Vita to all comers, emphasising its high diastase value.—(36) FRANK COOPER, LTD. (Victoria Works, Oxford), showed their well-known series of preserves, including sugarless marmalade and jams for the diabetic; and chutney and walnut pastes.—(77–79) COW AND GATE, LTD. (Guildford, Surrey), in addition to their well-known milk foods for infants, pointed out Allergilac, a food specially prepared for allergy in infancy by the elimination of lactalbumen, the denaturisation of the casein, and the suitable adjustment of the pH value; Prolac, a protein milk; and their new Natural Teat which demands from the baby a munching instead of a sucking action.—(115) ENERGEN FOODS CO., LTD. (Willesden, N.W.), showed their various standard breads, biscuits, and cereal foods for obesity, indigestion, diabetes, and other conditions in which a special diet is desirable.—(8) WM. GAYMER AND SONS, LTD. (Attleborough and London). This ever-popular stand dispensed cider to all comers.—(163) GRANOSE FOODS, LTD. (Watford), displayed their crispbread biscuits for digestive troubles, and special bread and biscuits for diabetes and obesity.—(134) HEUDEBERT DIETETIC PRODUCTS (124, Victoria-street, S.W.) showed their various diabetic and other dietetic products, especially their series of breads, which contain respectively 5 per cent., 20 per cent., and 35 per cent. of carbohydrates.—(108) HOVIS, LTD. (London), had an exhibit showing the processes of turning wheat into flour and the method of making their bread; they also drew attention to a new type of cheese biscuit.—(112) INGRAM AND ROYLE, LTD. (45, Belvedere-road, S.E.), drew attention to the various waters for which they are agents, particularly Vichy, Hunyadi Janos, and Contrexéville-Pavillon.—(49) KEEN, ROBINSON AND CO., LTD. (Carrow Works, Norwich), emphasised again the medicinal value of mustard, and showed their Almata synthetic food for infants and invalids, and Robinson's Patent Barley and Groats.—(68, 69) NESTLÉ AND ANGLO-SWISS CONDENSED MILK CO. (6–8, Eastcheap, E.C.), in addition to their condensed milk and milk food, showed Lactogen, a scientifically prepared full-cream cow's milk with added cream and lactose.—(63) PEEK, FREAN AND CO., LTD. (Drummond-road, Bermondsey, S.E.), in addition to their Vita-Weat and biscuits, drew attention to Spiced Bran Fingers, the bran correcting constipation and the spices acting as a carminative.—(136) SISTER LAURA'S INFANT AND INVALID FOOD CO., LTD. (Springfield Works, Bishopbriggs, Glasgow), displayed their baby food and also Zomogen, a liquid restorative for anæmia and debility, especially recommended for backward children. They claim that it contains no metallic iron and does not irritate the stomach.—(126, 127, 128, 129, 130) TRUFOOD, LTD. (Creameries, Wrenbury, Cheshire), emphasised the value of their product, which is dehydrated by a special process which does not cook the fats or oxidise them.—(123) VIROL, LTD. (Hanger-lane, Ealing, W.), once again showed their well-known preparations Virol, Virol and Milk, and Virolax.—(80) VITALIA, LTD. (11, Springfield, Upper Clapton, E.), showed their well-known meat juice preparation.—(85) VITAMINS, LTD. (23, Uppermall, W.), drew attention to their Bemax preparation of vitamin B, and Bemax vitamin chocolate.

Books, Spas, and Miscellaneous

(21, 22) BAILLIÈRE, TINDALL AND COX (7 and 8, Henrietta-street, W.C.) specially drew attention to the following books: Rose and Carless' "Manual of Surgery," now in its 14th edition; "Minor Maladies and their Treatment," by Leonard Williams, in its 6th edition; "Endocrine Medicine," by William Engelbach (in 4 vols.); and "Diseases of the Skin," by R. W. Mackenna, in its 3rd edition.—(60) BATH was represented by a stand showing pictures of the various cures and amenities of the spa.—(52) BUXTON had an exhibit to draw attention to the value of the waters, both bottled and drunk fresh in the town, and to the balneological facilities provided for patients.—(9) THE GAS LIGHT AND COKE CO. (Horseferry-road, S.W.) illustrated an entirely new series of gas fires of the Portcullis type, which can be either let into the wall on the panel system, stood on the hearth, or moved about the room. The series included a wide range of attractive colours and stainless steel tiles.—(152) HARROGATE'S stand showed a cinema film of the many approved treatments available, and laid special emphasis on the natural sulphur and alkaline baths, and also the peat bath. The new Fango medicinal mud is being used successfully.—(20) WILLIAM HEINEMANN (99, Great Russell-street, W.C.) had a large display of medical books, including the second editions of McDowall's "Science of Signs and Symptoms"; of Hewer and Sandes' "Introduction to the Study of the Nervous System"; and of Souttar's "Art of Surgery"; also the new life of Lettsom, by Johnston Abraham.—(67) KOLYNOS INCORPORATED (Chenies-street, W.C.), in addition to their older preparations, introduced Sylac, a perborate of soda, for keeping the teeth, gums, and mouth clean; it gives off nascent oxygen in water.—(32, 40, 41) H. K. LEWIS AND CO., LTD. (136 and 140, Gower-street, W.C.), had their usual display of furniture for the doctor's consulting-room—roll-top desks, mahogany cabinets and chairs; ledgers, notebooks of all kinds, and chromium name-plates. They also showed many medical books, including "Recent Progress in Medicine and Surgery," by Sir John Collie; "A Short Practice of Surgery," by Hamilton Bailey; "Common Skin Diseases," by A. C. Roxburgh; "The Principles and Practice of Otology," by F. W. Watkyn-Thomas; and "Internal Derangements of the Knee-joint," by A. G. Timbrell Fisher.—(19) THE MEDICAL AGENCY, LTD. (Dudley House, Southampton-street, W.C.), emphasised the value to doctors of their continuous, day-and-night service for supplying reliable locum tenents, assistants, and dispensers. They also advise in the buying and selling of practices, and conduct all the business and negotations for the doctors concerned. They audit books, arrange for loans, and mortgages, and effect all classes of insurance.—(161) THE MEDICAL SICKNESS, ANNUITY AND LIFE ASSURANCE SOCIETY, LTD. (300, High Holborn, W.C.), had their usual stand to encourage practitioners to insure against sickness and accident; they were busy explaining the new National Health Insurance and B.M.A. pension and disability insurance scheme, which provides excellent benefits for the practitioner.—(76) THE MEDICAL PRESS AND CIRCULAR (8, Henrietta-street, W.C.) drew attention to their quarterly symposiums, of which the latest is on Diseases of Children, published this week; and to their weekly series of articles on Modern Treatment and General Practice.—(72) NATIONAL OPHTHALMIC TREATMENT BOARD (1, High-street, Marylebone, W.) had a stand to explain the service which they provide, in conjunction with the B.M.A., for persons of limited means. A patient can be sent to an ophthalmologist and have the necessary glasses at a scheduled inclusive charge, ranging from 15*s.* to 33*s.*—(25) OXFORD UNIVERSITY PRESS (Amen House, E.C.) displayed prominently, among their large selection of medical books, "Diseases of Infancy and Childhood," edited by Leonard Parsons and Seymour Barling and written by 46 authorities; Heald's "Injuries and Sport";

Kenneth Walker's "Enlarged Prostate and Prostatic Obstruction"; and Clephan and Hills "Elementary Handbook on Radium."—(153) THE PRACTITIONER (6–8, Bouverie-street, E.C.) had on view several of their valuable special numbers, including the October issue on Modern Treatment, and a symposium on Birth Control.—(98) JOHN WRIGHT AND SONS, LTD. (Bristol), displayed the Medical Annual; the Index Series, of which Hutchison's Index of Treatment is an example, and their Synopsis series, which now includes medicine, surgery, midwifery, and physiology.

In the account of the exhibition in our issue of Oct. 21st mention was made of Vagotonine (Anglo-French Drug Co.). This is not, as stated, an extract of regulating hormones, but is said to be a natural pancreatic hormone having a regulatory action on the organo-vegetative system.

CORRESPONDENCE

DIET AND WEIGHT

To the Editor of THE LANCET

SIR,—In your leading article of Oct. 14th occurs the following statement: "We raise these questions not to impugn in any degree Prof. Dodds's main contention, but only to enter a caveat against an impression which his remarks may have left that *any* form of obesity can be reduced by suitable application of the principles he outlines. This is quite true of the exogenous obesity commonly met with in middle-aged persons, *but it is certainly not true of the endogenous cases*—(our italics)."

We feel that this statement might be construed to confirm that prevailing attitude of despair towards these unfortunates which Prof. Dodds has been at some pains to dispel. The daily output of energy cannot fall below a certain minimal level, and if the energy furnished by the diet does not exceed this level the subject must either lose flesh, sleep all day, cheat his physician, or violate the law of the conservation of energy. The basal heat output has been found by competent observers to fall within normal limits in most "exogenous" and many "endogenous" cases of obesity. In a few of the latter rather low readings have been found, but even such exceptions respond to diets calculated in accordance with basal needs.[1] It is, of course, quite possible that a patient afflicted with "endogenous" obesity may respond more slowly to dietetic restriction than an exogenous case, for the additional energy dependent on diurnal activity may be different in the two cases. A reducing diet may also be more irksome to a patient whose obesity is the result of pathological hunger than to an habitual over-eater.

Some of the prevailing confusion arises from the erroneous assumption that loss of flesh and loss of weight are synonymous terms. Restriction of diet is not always followed immediately by loss of weight and L. H. Newburgh [2] has shown that in such cases the loss of fat is masked by retention of water. This retention of water is only a temporary phenomenon, but it emphasises the need for perseverance. In the same connection, it is possible that the apparent virtue of the Turkish bath in obesity may lie in temporary dehydration from sweating.

Admitting that the ultimate nature of obesity is in many cases obscure, the fact remains that its successful reduction by dietetic restriction is conditioned simply by the fortitude of the patient.

We are, Sir, yours faithfully,

F. B. BYROM.
DONALD HUNTER.

London Hospital, Whitechapel, E., Oct. 30th, 1933.

NASAL INFECTION IN THE PSYCHOSES

To the Editor of THE LANCET

SIR,—As a practitioner who for twenty years has had opportunities of investigating the rôle of focal sepsis in the production of the psychoses I wish to add my contribution to this correspondence. So long ago as 1914 Sir W. Arbuthnot Lane removed at my request portions of intestine in cases of certifiable insanity. These patients are still alive and well, and have since operation remained in full mental health. The late Dr. Henry Cotton paid more than one visit to London to study the methods of laboratory overhaul adopted by some of us, and I had the pleasure of collaborating with Dr. Graves in introducing laboratory methods of investigation in his hospitals. In my own practice I have seen excellent results in many psychoses, some less, some more advanced, follow a systematic examination of the patient in the laboratory; teeth, tonsils, sinuses, intestinal and uterine mucosal surfaces have all contributed to these happy results. Since 1919 I have in a very large number of cases been able to confirm the late Ford Robertson's estimate of the definite neurotoxic power of certain members of the diphtheroid group. These are a common find in many psychoses, and I have treated these cases with satisfactory results by autogenous detoxicated vaccines of the diphtheroid isolated. I am, Sir, yours faithfully,

A. WHITE ROBERTSON.

Welbeck-street, W., Oct. 28th, 1933.

PROBLEMS OF ASTHMA

To the Editor of THE LANCET

SIR,—In your report of the discussion on asthma at a recent meeting of the Paddington Medical Society, Dr. Swietochowski "observed that many male patients seemed to inherit asthma from their mothers, while females inherited it from their fathers." Investigating this statement in the light of my own figures, I find that in one consecutive series of 700 cases of asthma my figures are as follows. I will not be so bold as to say that a child inherits asthma from anybody, but of the males (352) in this series a history of asthma or hay-fever was present in 87 cases in the father and his immediate relatives and in exactly the same number (87) in the mother and her immediate blood relations. Of the females (348) an asthmatical history or one of hay-fever was present in 73 of the fathers' side and in 77 of the mothers' side. In another series of 400 cases of hay-fever a direct history of hay-fever in the actual parents was present in 16 fathers and 18 mothers of 211 males. In 189 females, 13 fathers and 14 mothers were affected themselves by hay-fever. In neither case do the figures lend support to Dr. Swietochowski's statement.

At the same discussion Prof. Millais Culpin is reported as saying, "Feather-sensitiveness might in some cases be due to the juvenile association of the smell of feathers with the witnessing of sexual intercourse between the parents." Now if 20 or more unknown proteins be applied by the scratch method or intradermally to the skin of these feather-sensitive people, reactions will be obtained to feathers without the patient in any way knowing the nature of the proteins which are being applied. Are we really asked to believe that the shock of the scenes described

[1] Wilder, R. M., Smith, F. M., and Sandiford, I.: Ann. Internal Med. 1932, vi., 724.
[2] Jour. Amer. Med. Assoc., 1931, xcvii., 1659.

are sufficient to change the whole blood of the child and every cell in its body, so that forever afterwards it will be sensitive to feathers by the skin reactions—to say nothing of giving the Prausnitz-Küstner reaction after the blood has actually left its body. If it were not that feathers enter so largely into the bedroom furniture, no one, not even the psycho-analyst with all his special training in sexual matters, could have thought out so fantastic an explanation—or have they similar unpleasant explanations as to why people are sensitive to eggs and fish and pollen?

Enormous strides forward have been made in the treatment of asthma in the past few years. In every case the new work has tended to provide definite physical and biochemical explanations of phenomena that were formerly looked upon as fanciful and neurotic tendencies on the part of the patient. In my opinion there are better ways of treating patients sensitive to feathers than by giving them explanations which seem to some of us so far-fetched.

I am, Sir, yours faithfully,

London, W., Oct. 30th, 1933. FRANK COKE.

IMPACTED MOLAR TEETH

To the Editor of THE LANCET

SIR,—For the purposes of a lecture at the Royal College of Surgeons early next year I am collecting all the evidence relating to severe disturbances associated with either upper or lower impacted third molars, such as chronic infection, malignancy, cysts, fractures. May I appeal through your columns to readers who may have the notes of any such cases to send me a brief summary, accompanied if possible by skiagrams or tracings showing the position of the tooth concerned. I shall take care that all radiograms and other original records are returned to the sender.—I am, Sir, yours faithfully,

C. BOWDLER HENRY, M.R.C.S., L.D.S.Eng.,
Lecturer in Oral Surgery, Royal Dental
Oct. 30th, 1933. Hospital, Leicester-square, W.C.2.

HISTAMINE IN RHEUMATISM

To the Editor of THE LANCET

SIR,—I have read with much interest the report of work by Dr. Bisset and Mr. Woodmansey in your last issue (p. 1018) and I am in complete agreement with their findings, but would like to add a few words from my own experience. In my work on ionisation with histamine during the last few months I have found a considerable percentage of cases of unquestionable clinical identity in which there has been an immediate freedom from all pain, nor has any suspicion of pain returned in the part treated. Then come the large and remaining percentage of cases which fall within the limits of the Harrogate findings—namely, gradual and definite improvement. The authors do not record any failures; possibly their findings agree with mine in this matter, where so far, with careful selection, no case has failed to react in a satisfactory manner.

I early discarded the method of using an aqueous solution as a routine, except in treating whole extremities, for a preparation with a glycerin base for direct application to the skin, using pads soaked in a saline solution. The treatment, as at Harrogate, has been taken in conjunction with the routine course of baths, &c. May I take this opportunity of expressing my appreciation of the assistance I have received from Messrs. Hoffmann-La Roche, Ltd., who placed their preparations at my disposal for experimental purposes.—I am, Sir, yours faithfully,

F. SEVERNE MACKENNA.

Droitwich Spa, Oct. 30th, 1933.

OIL BEFORE SUNBATHING

To the Editor of THE LANCET

SIR,—As surgeon of a large cruising liner I should be glad if any of your readers can give me information about the application of oils before exposing the body to the sun's rays in tropical and subtropical regions. Some of the worst cases of sunburn I have been called upon to treat had used oil before sunbathing. Possibly some of these had been lured into false security by the use of oil and had therefore overdone their sunbath, but this does not seem to account for all cases. Since I have adopted the practice of issuing notices discouraging the use of oil the occurrence of sunburn has diminished. I should therefore be very interested to learn the views of others on this subject.

I am, Sir, yours faithfully,

J. C. B.

The Club House, Overseas League, Oct. 29th, 1933.

BEQUESTS TO MEDICAL CHARITIES

To the Editor of THE LANCET

SIR,—In reference to the scheme brought forward in your issue of Oct. 21st, which you kindly qualified as "a fine proposal," I enclose a model codicil for addition to the Will of testators who approve of the scheme.

I, A. B., of _____ do make and declare this to be a Codicil to my last Will, which Will bears date the _____ day of _____, 19____.

I do hereby give and bequeath unto _____ the sum of _____ pounds free of legacy duty.

And in all other respects I confirm my said Will.

In witness whereof I hereunto set my hand this _____ day of _____, in the year of our Lord one thousand nine hundred and _____.

A. B.

Signed by the said A. B., the Testator, as a Codicil to his Will, in the presence of us, present at the same time, who in his presence and in the presence of each other subscribed our names as Witnesses.

C. D., of _____ (occupation)

E. F., of _____ (occupation).

The codicil should be kept with the Will. The witnesses need not be the same as the witnesses of the original Will. While the original scheme of course set no bounds to generosity, it mentioned the conditions under which the bequeathing of £100 to either of two charities by a testator would stimulate others to follow the example.

I am, Sir, yours faithfully,

Oct. 26th, 1933. BACKBENCHER.

HYSTERIA IN DOGS

REFERRING to the paragraph numbered (1) of Mr. H. D. Walston's letter, appearing in THE LANCET of Oct. 21st (p. 945), the Chief Veterinary Officer of the Ministry of Agriculture points out that since the year 1902 rabies has existed in this country outside quarantine stations only during the period from 1918 to 1922. The diagnosis of rabies, which is a disease scheduled under the Diseases of Animals Acts, rests with this Ministry, and no case is declared solely upon the symptoms shown by the suspected animal; a positive diagnosis in all cases is based upon the demonstration of Negri bodies or the result of inoculation.

OBITUARY

SIR ALEXANDER HOUSTON, M.B., F.R.S.

DIRECTOR OF WATER EXAMINATIONS, METROPOLITAN WATER BOARD

WE regret to announce the death of Sir Alexander Houston which occurred at Hampstead on Sunday last. In these columns quite recently we noted that the state of his health had obliged him to resign his post as director of water examinations to the Metropolitan Water Board as from the end of the present year.

Alexander Cruikshank Houston was born in 1865, the eldest son of the late Surgeon-General John Houston. Educated at Merchiston Castle School and at the University of Edinburgh, he graduated as M.B., C.M. in 1889 and as D.Sc. in 1892, and in the course of his career was a prizeman in public health and medical jurisprudence. His connexion with water investigations, which has made his name famous, followed closely upon the termination of his university career, for as early as 1893 we find him employed in researches on behalf of the Local Government Board into the connexion between lead poisoning and moorland water-supplies. From that time forward his work with regard to water-supply and the questions of public health immediately related thereto became continuous. For the London County Council he made important researches on sewage disposal at Crossness and Barking, and in respect of certain developments of this work he reported on the bacteriological contamination of milk and of watercress beds. He acted as bacteriologist to the Royal Commission on Sewage, instituted in 1899, while in 1903 he was the expert in arbitration proceedings in connexion with the Metropolitan water-supply, and in 1905 was engaged as bacteriologist to the Lincoln Corporation during the epidemic of typhoid fever which fell upon the city in January of that year. This outbreak afforded a striking instance of a catastrophe resulting from the employment of contaminated sources, while relying upon filtration of the water to remove the risks. Houston made a valuable report to the Local Government Board upon the epidemic, and a systematic treatment of the whole water-supply of Lincoln with hypochlorite of soda was instituted pending alterations in the service. To this work Houston himself referred in one of his admirable reports to the Metropolitan Water Board as "the dawn of chlorination."

SIR ALEXANDER HOUSTON

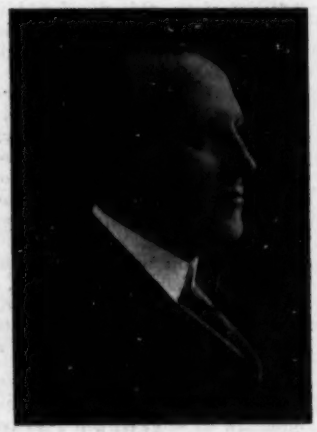
[Photograph by Russell

In 1905 the Metropolitan Water Board decided to establish a central laboratory to meet the provision of the Metropolitan Water Board Act, 1902, which placed upon the Board the express duty of making arrangements for "chemical and bacteriological examinations of, and experiments as to the condition of, the water to be supplied by them." The first holder of the office carrying these responsibilities was Houston, and for the following 28 years he discharged them with the energy and success which all know. Our readers will have gathered from the annual analyses of his reports in how many directions his researches solved problems relating to the protection of water-supply and the securing of its purity; and those who have read the actual documents will recall with pleasure the literary qualities and unforced humour with which Houston could tell the tale of his strenuous labours.

Outside his work for the Metropolitan Water Board Houston's advice was often sought; for example, he was lent as an expert both to Cairo and Ottawa in each of which cities water-supply problems presented themselves, and the public recognition of his services was well-merited. He was created K.B.E. in 1918 and C.V.O. in the following year, and in 1931 was elected F.R.S.

FRANCIS GRAHAM CROOKSHANK, M.D., F.R.C.P. Lond.

Dr. F. G. Crookshank, whose death occurred at his house in Wimpole-street on Oct. 27th, was born at Wimbledon in 1873, and was educated at University College, London, receiving his medical training at University College Hospital. He was a distinguished student, graduated with the university scholarship and gold medal in medicine in 1895, and held the house appointments at his own hospital and at Brompton. Early in his career he was attracted by psychiatry and held for a time an appointment at the Northampton County Asylum, after which he practised in partnership at Barnes with charge of the local isolation hospital and police supervision. But by the time the war broke out he had turned definitely to clinical medicine and had secured appointments to the French Hospital and the Prince of Wales's General Hospital. During the war he served in France, holding among other appointments that of medical director of the English Military Hospital at Caen, where his knowledge of French and German was often of value to his colleagues and to patients and prisoners of all sorts. In 1918 he was one of the first to describe a series of cases with unusual cerebral symptoms, which were fitted later into the picture of lethargic encephalitis.



DR. CROOKSHANK

[Photograph by Elliott & Fry

On return to civil practice he now manifested his curious literary ability. He had previously written and edited some medical essays, but from

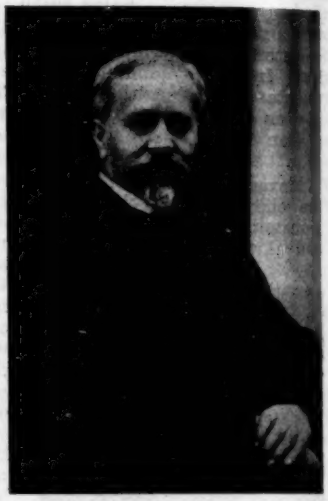
1920 onwards he discussed constantly the philosophic relations of medicine. His original outlook was evident in the remarkable book on influenza which appeared under his authorship in 1922, and his contributions to meetings, journals, and books became frequent; thus he contributed chapters to systematic works on psychology and psychotherapeutics, and supplied introductions to, among other books, Blondel's "Morbid Conscience," Wexberg's "Individual Psychology and Sex," and Adler's "Problems of Neurosis." In these introductions, as in the Bradshaw lecture delivered before the Royal College of Physicians of London in 1926, and entitled the Theory of Diagnosis, he displayed unusual erudition, and a subtlety of argument which more than occasionally defeated its own purpose, requiring for its comprehension, and not obtaining, a similar subtlety on the part of reader or audience. In argument consequently Crookshank was too ready to blame the other side for failures to perceive what he had failed to explain and, mainly for this reason he never obtained the recognition as a thinker which his attainments warranted and which were displayed in writings upon sexual problems, mongolism, spiritual healing, and many other topics, clinical and psychiatric.

Crookshank's book "The Mongol in Our Midst" demonstrated most clearly the originality of his mind. Behind his clear description of mongolism lay a strong plea for the recognition of a polygenetic origin of man, a view which though opposed by many anthropologists appears to be gaining ground, though not all of his advocacy is accepted. In recent years he became the disciple of Adler and was the leading propagandist of individual psychology in this country. When Adler was in England in 1925 he asked Crookshank to form a medical group in London in association with his own group in Vienna. Formed at first in association with the Adler Society, this developed three years later into the Medical Society of Individual Psychology, the remarkably rapid success of which may be attributed to Crookshank's energy and persuasiveness. He secured the presence of Adler himself and of Seif to lecture there and edited a series of pamphlets enforcing the value of individual psychology in medicine. By a tragic coincidence the last of these, entitled Individual Psychology and Nietzsche, appeared from his own pen shortly before his death; it is an exposition of his philosophy and attitude to life. Crookshank was seen at his best in the discussions at this society. His extraordinary readiness in debate, his skilful dialectic, aptness of quotation, and brilliance of illustration found full scope therein. It is by the freshness of his outlook and his vigorous though engaging methods of controversy that he will be best remembered.

ALBERT CALMETTE

LESS than a fortnight ago Prof. Calmette was busy in the laboratories of the new building in the Pasteur Institute, organising research, giving refugee German Jews an opportunity to continue their work, attending conferences, and acting as administrative head of the Pasteur Institute in the absence of Prof. Roux, to whose sick-bed he paid daily visits. As late as Oct. 24th he was present at the French National Congress of Hygiene at which he spoke. Soon afterwards he showed signs of peritonitis, and he died last Sunday morning.

Born in 1863, Calmette entered the medical service of the French navy at the early age of 20. He soon developed a taste for the then new science of bacteriology, and when in 1890 he came back to France he attached himself to Pasteur in Paris. His gifts did not escape Pasteur's notice, and in due course he was picked out to take charge of the institute at Saïgon, in French Indo-China. Here, in comparative isolation, he found that his first problem was a very high mortality from snake-bite. Behring's and Kitasato's work had shown how the effects of tetanus and diphtheria might be combated by a specific serum, and Calmette set himself to prepare a serum that would neutralise the snake toxin—a task in which he was to some extent successful. Another discovery at this stage of his career was of a low-grade mushroom capable of converting starch into sugar and alcohol. Its commercial exploitation by distillers provided him with funds which he devoted to his scientific work.



PROF. CALMETTE

On his return to France in 1895 Calmette was appointed director of the new Pasteur Institute in Lille and here he spent more than twenty years, happily combining his gifts for administration and for scientific research. He found for example that hookworm was responsible for much disease among miners in the north of France, and the principles laid down for his campaign against it remain valid to this day. Tuberculosis he studied from the beginning with the methodical and untiring perseverance which characterised his work. He was among the first to realise—what now seems obvious—that success in the campaign against it requires the recognition of the disease at an early stage. In 1901 he put this theory into practice by establishing the Emile Roux dispensary for its early diagnosis. At this centre working-class people were taught the elements of hygiene, and advice was given to patients who had to make the best of treatment at home.

In studying the prevention of tuberculosis Calmette came comparatively early to the conclusion that a living virus is more likely than a dead vaccine to confer durable immunity. This led to his investigation of bovine tubercle bacilli cultivated under conditions calculated to reduce their pathogenic properties to vanishing point, and in collaboration with Guérin he eventually prepared the now familiar vaccine, B C G. When the late war broke out, the work on B C G had already reached the stage of cattle vaccination. Then Lille was occupied by the Germans, and for the next few years Calmette, who remained in the city, had to abandon the systematic tests which he had planned. During the four years that followed, however, he found an outlet for his energies in the completion of his book on

tuberculosis, a gigantic study in which he reviewed the researches of himself and other workers. At the same time, throughout the occupation, he was a pillar of support to his fellow-citizens who found in his calm courage and faith in the future just that help they needed. In 1917 he accepted the appointment of assistant director of the Pasteur Institute in Paris under Roux, but he did not leave Lille till after the war. At last he was free again to study the effect of B C G on animals.

When the time came for giving B C G to human beings, something more than vicarious courage was needed. If the experiment failed, if B C G resumed in the human body the qualities of the original culture and gave rise to fatal tuberculosis, the experimenters would find themselves in an invidious position. Two men took this risk deliberately, and between 1921 and 1924 Weill-Hallé and Turpin gave the vaccine, by mouth, to 321 new-born infants. Fortunately, there was no disaster. On the contrary, the infants throve, and the reports were so encouraging that in July, 1924, Calmette decided to put B C G at the disposal of doctors and midwives. The result has been that more than a million human beings have now been vaccinated with it. The experiment has been one of the largest of its kind, and in France, where most of the work has been done, there are few who doubt its success. The figures collected by the Pasteur Institute seem to show that the mortality among the B C G babies is much lower than that of others, but the case in favour of the vaccine cannot yet be regarded as statistically complete. During the last few years, moreover, the movement in favour of its general use has had an undeserved setback through the disaster at Lübeck in Germany. Some of the medical authorities of Lübeck, it will be recalled, wished to give B C G a trial, and obtained a consignment direct from the Pasteur Institute. Some time elapsed between the receipt of this consignment and the administration of some of it to numerous babies in the town. It will never be known exactly what happened in the laboratory where this consignment was kept, for soon after the infants who had been vaccinated began to fall ill and die, the remaining cultures were precipitately destroyed. From the subsequent investigation, however, it seems probable that a virulent culture of tubercle bacilli of the human type had, by a series of misunderstandings, been mixed in the laboratory in Lübeck with the harmless culture of B C G. Before this finding was reached there were endless opportunities for recrimination, but through the many phases of this distressing episode Calmette maintained his attitude of unflinching courtesy. Personal attacks were little to him in face of his concern lest a fault might be found in the vaccine on which he placed such splendid hopes.

PANEL AND CONTRACT PRACTICE

The Panel Conference and After

LAST month's conference will give the Insurance Acts Committee plenty to do in the coming year. It arrived at decisions often quite unexpected, without waste of words. There was in fact little sign of the usual queue of speakers anxious to address the meeting after a resolution had been proposed. This may be testimony to the way Dr. Dain, as chairman of the I.A.C., deals with the problems put up in resolutions by panel committees; at the banquet following the conference he described as easy meat the speakers who did not know the regulations on subjects about which they were talking. One committee, for instance, wished to make it compulsory on approved societies to inform the local insurance committee at once when they received notice of the marriage of an insured female. This is already in force, but the regulation fails when, as often happens, the insured person does not inform the society of her marriage. The resolution by Kent about "collective own arrangers" was the result of not putting into force existing regulations. Certain institutions are allowed to have one or more of their medical officers under contract with the local insurance committee, solely for the purpose of attending the resident staff. Sometimes it is the medical officer, more often the authority employing him, which receives the capitation fee less a percentage owing to the restrictive work. The institution or authority which engages the insured person makes it one of the conditions of service that he/she shall go on this doctor's panel list. The plan works quite well as long as the insured person remains in the institution, but apparently in the Kent area these persons often live out, and are therefore not within the terms of service of the medical officer of the institution on whose list they are. One of the resident staff may be sent home ill; who is then to attend the case and how is he to be paid for it? Temporary resident treatment does not apply because in the Kent cases the patients are at home. The emergency scheme does not apply; they are insured persons who have paid for their stamps and are therefore entitled to medical benefit. Kent complained that the institution doctor refused to attend them when outside the institution, and that in consequence the nearest insurance doctor was called in to do his work. This was, it seems, done without charge, but really the medical service subcommittee might have dealt with the situation under existing regulations. One of the most striking decisions of the conference was that deputies should be allowed to take the place of representatives of the local medical or panel committee on insurance committees. Although carried, on the motion of London, by quite a large majority, it is not likely to be accepted by the Ministry or by the approved societies.

Dispensing Ointment

At the last meeting of the insurance committee for London an hour was occupied in discussing a pharmaceutical service case in which an ointment had been dispensed in a reputed two-ounce chip box. The ointment had been weighed but apparently no account taken of the weight of the box, and there was a deficiency of grs. 77 out of grs. 960 ordered. The subcommittee had suggested failure to observe the terms of service but did not propose to withhold money. An amendment to censure and withhold money was eventually lost. The arguments for and against were various, and included an allegation that the chemist had deliberately supplied short weight. As a matter of fact the custom in dispensing ointment is just to fill the proper sized chip box. If the ointment is light the weight supplied will not be quite up to the amount ordered; if the ointment is heavy over-weight will be supplied. It should have appeared, even to laymen, almost impossible that there was any fraud in such a method. It is high time the Ministry and the pharmacists came to some agreement on the way to dispense ointments.

Dropping Out of Benefit

On Tuesday last Sir Hilton Young (Minister of Health) and Mr. Skelton (Under-Secretary of State for Scotland) received a deputation from the Federation Committee of the Associations of Insurance Committees in England, Scotland, and Wales. The object of the deputation was to bring to the attention of the Government the view of the committee that those persons who, in consequence of the provisions of the National Health Insurance Act, 1932, will cease to be entitled to medical benefit at the end of the present year, should be maintained in benefit by the aid of a special grant from the Exchequer. Mr. Marshall (Lanarkshire) said that the effects of the Act would be specially hardly felt in the depressed areas, in some of which 40 to 50 per cent. of the population were unemployed. He did not think that the Act would effect any substantial economy, inasmuch as medical assistance would have to be supplied by local authorities; the real question was whether the cost should be borne by the Exchequer or by the rates. Mr. Wright (Cheshire) said that the cost of maintaining in medical benefit those persons who would lose their title to it would be relatively small and would be only temporary if, through an improvement in trade, the persons concerned returned to insurance. Mr. Llewellyn-Jones referred especially to the serious position in Glamorgan where the poor-rate was already 8*s*. 5*d*. in the £. The Minister reminded the deputation that the health insurance fund had been threatened with serious financial difficulties. There were three possibilities: to increase contributions, to reduce benefits, or to provide an Exchequer grant. Increase of contributions was admitted by all to be impossible; an Exchequer grant would have meant the breakdown of the organisation as an insurance scheme. Extensions of benefit had been given to the persons concerned to the utmost possible limit, if benefits were to continue to bear any relation at all to contributions. There was no fear that insured persons who ceased to be entitled to medical benefit would lack proper medical attention under the arrangements made by public assistance committees. Mr. Skelton associated himself with what had been said by the Minister of Health

PUBLIC HEALTH SERVICES

Dysentery Bacilli as a Cause of Food Poisoning

DYSENTERY, often of mild type, is probably much more prevalent in this country than is commonly supposed. This was brought out by J. A. Charles and S. H. Warren,[1] and Dr. David Nabarro's work points in the same direction. It is only lately, however, that dysentery bacilli have been recognised as a cause of acute food poisoning. The distinction is somewhat artificial, since epidemic dysentery, if spread by food, is a form of food poisoning. What is under consideration are acute attacks of illness of food-poisoning type which are almost identical in clinical manifestations and epidemiological features with ordinary salmonella food-poisoning outbreaks. W. G. Savage and P. Bruce White[2] first drew attention to outbreaks of this nature due to dysentery bacilli, and amongst their 100 outbreaks are included four due to dysentery strains, one being of Flexner type, and three allied to, but not identical with, the Sonne strain. The symptoms in these outbreaks were those of acute food poisoning and not dysenteric. An outbreak described by R. E. Smith[3] is interesting because some of the cases were very acute in onset and rather of food-poisoning type. This epidemic was due to *B. dysenteriæ* Sonne.

The importance of the Sonne type in relation to food poisoning has again come into prominence in connexion with the recent outbreak of food poisoning in St. Pancras and Holborn (London) whose cause and course have now been ascertained in the face of considerable difficulties. The onset was on Oct. 7th, and so far as present information is available there were ten cases, with two deaths. The children who died were aged 11 and 13. The clinical symptoms were those ordinarily associated with food poisoning—namely, vomiting and acute abdominal pain—and there was also passage of blood and mucus in the stools and a high temperature in some cases. The vehicle of infection was pease pudding made from dried peas, boiled with some soda bicarbonate in a saucepan. Since the outbreak was limited to those who consumed a particular batch of pudding on Oct. 7th, and the same peas were used for earlier batches, the infection was something which affected that particular lot of pease pudding. Bacteriological examination of the dried peas yielded negative results, while, on the other hand, dysentery bacilli were found in large numbers in the pease pudding. The evidence at the inquest suggests that a little girl had been a carrier of the bacilli for some time, and that she was the probable source of infection. This child took some pease pudding and apparently dipped her fingers into it when taking it from the dish in which it was contained.

In salmonella food poisoning a chronic bacillus-carrier is exceedingly rarely implicated, but carriers of human dysentery bacilli are not uncommon. In this outbreak the strain responsible was *B. dysenteriæ* Sonne, and it is evident that this strain must be kept in mind as a possible causal agent in acute food-poisoning outbreaks. The presence of blood and mucus in the stools—features somewhat uncommon in salmonella food poisoning—is a useful pointer. An early provisional bacteriological diagnosis is of importance here, since the dysentery and salmonella types do not infest equally the same portions of the intestines, and if a dysentery strain is suspected special care must be taken to include the large as well as the small intestine in the portions selected for examination in post-mortem material. In specimens sent for examination dysentery bacilli may be overlooked unless the possibility of their presence is borne in mind.

[1] THE LANCET, 1929, ii., 626.
[2] M.R.C., Special Report Series No. 92, 1925.
[3] THE LANCET, 1931, ii., 925.

London Milk

Last Tuesday's meeting of the London County Council endorsed an important report from its central public health committee on the milk-supply of London. Since 1907, when the examination of milk coming into London commenced, the proportion of samples containing tubercle bacilli has had its ups and downs; starting at 11·6 per cent., it dropped to 7·9 just before the war, and continued to fall in the earlier war period, with a sharp rise in 1917. It then fell again and for about a decade kept at a low level, the lowest point being in 1922, when only 2·6 per cent. of the milk examined was tubercle-infected. It rose again to 9·3 per cent. in 1932, taking churn milk only; or 10·9, including samples of tank milk. Forty per cent. of London's milk-supply now arrives in tanks, and an investigation was undertaken to see to what degree this tank milk is infected with tubercle

bacilli. Of 18 tanks examined, 15 (83 per cent.) contained tubercle bacilli, and of these 15, 7 were positive to a test with 50 c.cm. of milk, 5 with 5 c.cm., and 3 with 0·5 c.cm. These figures are regarded as probably understating the actual infection. As it is impossible to say where a point is reached when the dilution of tuberculous milk is such that no danger to human life will result, it is necessary in the committee's view to regard all tuberculous milk as potentially dangerous. This high T.B. content applies only to the milk as it arrives in London, not to the milk as it reaches the consumer; for, of the ten companies which use tanks to bring milk into London, nine pasteurise the milk on arrival by the "holder" process, and the tenth sterilises it. The difficulty of tracing tuberculous milk to its source is almost insuperable under present conditions, when one tank may pool milk from 150 or more farms. The Milk and Dairies (Consolidation) Act of 1915 failed to take into consideration such a situation as this. Compulsory pasteurisation has been advocated in some quarters and opposed in others, but as 90 per cent. of ordinary London milk is at present commercially pasteurised—and the public can ensure obtaining pasteurised milk by asking for it from their dairymen—the L.C.C. does not regard the matter as yet ripe for local action. It would like, however, the appropriate Ministries to urge upon county councils the great importance of ensuring the provision of a milk-supply free from tubercle bacilli, and the Ministers themselves to consider what action should be taken to overcome the difficulties created by modern methods of milk transport.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 21st, 1933

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 4908; diphtheria, 1261; enteric fever, 40; acute pneumonia (primary or influenzal), 739; puerperal fever, 23; puerperal pyrexia, 112; cerebro-spinal fever, 17; acute poliomyelitis, 25; encephalitis lethargica, 11; dysentery, 13; ophthalmia neonatorum, 74. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Oct. 24th–25th was as follows: Small-pox, 5; scarlet fever, 3192; diphtheria, 1932; enteric fever, 33; measles, 381; whooping-cough, 150; puerperal fever, 26 mothers (plus 9 babies); encephalitis lethargica, 256; poliomyelitis, 7; "other diseases," 155. At St. Margaret's Hospital there were 13 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In 118 great towns, including London, there was no death from small-pox, 3 (0) from enteric fever, 6 (0) from measles, 9 (1) from scarlet fever, 5 (3) from whooping-cough, 43 (7) from diphtheria, 99 (32) from diarrhœa and enteritis under two years, and 21 (6) from influenza. The figures in parentheses are those for London itself.

Of the deaths from diarrhœa, 14 occurred at Liverpool, 7 at Leeds, 6 at Sunderland, 4 at Hull, and 3 at Tottenham. Barnsley, Liverpool, and Northampton each reported one death from enteric fever. Six fatal cases of diphtheria occurred at Manchester, 4 at Coventry, 3 at Hull.

The number of stillbirths notified during the week was 238 (corresponding to a rate of 40 per 1000 total births), including 40 in London.

MEDICAL NEWS

Royal College of Physicians of London

At a meeting of the comitia of the College on Oct. 26th, Lord Dawson, the president, in the chair, Dr. F. H. Jacob, Sir Ewen Maclean, Sir Henry Dale, and Dr. F. R. Fraser were elected councillors. The following were elected representatives of the College: Dr. R. A. Young, as a member of the committee of management of the Conjoint Board; Dr. Comyns Berkeley, on the Central Midwives Board; and Dr. John Hay, on the court of governors of the University of Liverpool.

The president announced that Dr. E. H. R. Harries had been appointed Milroy lecturer for 1935, and that the Jenks memorial scholarship for 1933 had been awarded to Henry Newnham Peyton, late of Epsom College.

The following candidates, having satisfied the censor's board, were elected to the membership: Trevor Arthur Lloyd Davies, M.B. Lond; Sailendra Kumar Ghosh-Dastidar, M.B. Calcutta; Ronald Edward Jowett, M.D. Leeds; Patrick Corbett Mallam, M.D. Oxf.; Frederick Murgatroyd, M.D. Liverp.; Ralph Athelstane Noble, M.B. Sydney; Bangalore Venkata Subba Rao, M.B. Mysore; Hari Krishna Rustogi, M.B. Lucknow; William Edward Snell, M.D. Lond.; and Ian Oriel Thorburn, M.D. Melb.

Licences to practise were conferred upon 117 candidates (96 men and 21 women) who have passed the final examination of the Conjoint Board and have complied with the by-laws of the College. The following are the names and schools of the successful candidates:—

R. D. Ayyar, Madras; A. J. N. X. Babapulle, Ceylon and King's Coll.; Bridget M. Barcroft, Camb. and Royal Free; W. R. Billington, Camb. and Birmingham; G. W. Blomfield, Leeds; I. N. Blusger, Cape and St. Bart.'s; P. R. Boucher, St. Mary's; B. H. A. Bovet, Geneva and Guy's; Muriel Boycott and C. F. R. Briggs, Univ. Coll.; J. A. Brocklebank, Guy's; A. Brown, King's Coll.; G. C. Brown, Camb. and St. Mary's; R. E. Browne and J. A. C. Burridge, King's Coll.; K. L. Buxton, Camb. and St. Thomas's; W. H. Cartwright, T. L. Chester-Williams, and J. A. Chivers, St. Bart.'s; A. J. P. Coetzee, Edinburgh and London; K. R. D. Coles, Guy's; F. E. Corea, St. Bart.'s; C. F. Critchley, St. Thomas's; J. D. Cruickshank, Birmingham; Enid G. M. Cummings, Royal Free; D. O. Davies, St. Bart.'s; H. S. Davis, Camb. and Charing Cross; G. De Lacey, Cardiff and London; G. V. W. Doherty, Cape and Guy's; L. J. L. Edwards, St. Bart.'s; P. J. England and G. H. D. Evans, Cardiff; T. Fitt, Camb. and St. Thomas's; H. D. Fleming, St. Thomas's; H. C. Fletcher-Jones, Westminster; P. A. Forsyth, St. Thomas's; H. R. Fosbery, L.M.S.S.A., London and Middlesex; M. K. Gadgil, Bombay and West London; H. J. Gaudin, Otago; B. Gaunt, Birmingham; S. K. Ghosh, Patna and St. Bart.'s; Mary I. Gibson, Royal Free; H. W. Hall, Univ. Coll.; Susanna M. Halliday, Edinburgh; Ida M. Hamp, Royal Free; R. S. Handley, Camb. and Middlesex; H. G. Hanley, M.B., Liverp.; Beatrice J. Haram, Royal Free; N. H. Harwood-Yarred, Camb. and St. Thomas's; S. A. Hasan, Punjab; G. A. H. Herbert, London; C. A. Hodges, St. Thomas's; J. Holme, Manchester; A. C. L. Houlton, Camb. and St. Bart.'s; J. W. James, Univ. Coll.; Maisie F. James, Royal Free; R. G. James, King's Coll.; E. H. Johnson, Leeds; J. B. Jordaan, Cape and Guy's; J. S. Kapadia, Bombay and King's Coll.; Phyllis M. Kerridge, Univ. Coll.; Gwendoline D. Knight, Royal Free; Alfreda W. Krichauff, Adelaide and West London; E. H. P. Lassen, King's Coll.; J. B. Lee, Manchester; O. Lyth, Guy's; F. W. H. McMurdo, Birmingham; J. S. Marr, Aberdeen and London; K. R. Masani, Univ. Coll.; P. C. Matthew, Camb. and Univ. Coll.; S. A. Mian, Univ. Coll. and West London; C. B. Miller, King's Coll.; C. J. B. Murray, Middlesex; Frances C. Naish, Camb. and Royal Free; P. B. L. Nicholas, London; W. S. Nutt, Camb. and King's Coll.; Margaret M. O'Connor, Royal Free; V. G. Peckar, Univ. Coll.; G. D. Pirrie, Camb. and King's Coll.; Joyce A. Pope, Manchester and West London; Margaret R. Price, Royal Free; R. R. Race, St. Bart.'s; K. S. Ramaswami, Madras and Guy's; V. B. Reckitt, Guy's; L. R. J. Rinkel, Camb. and St. Thomas's; M. Ripka, London; Helen E. Rogerson, Manchester; Picotee E. Rose-Innes, Royal Free; J. E. Rowlands, Guy's; M. Sacks, Leeds; D. S. Saklatvala, Univ. Coll.; B. Samuel, Cardiff; P. R. Saville, London; B. Schulenburg, Cape Town; G. R. Sedleigh-Denfield and R. Shackman, St. Bart.'s; J. Shields, Camb. and St. Bart.'s; I. M. Shulman, St. Bart.'s; J. Smart, Camb. and St. Bart.'s; R. L. Soper, Guy's; M. S. Spink, Camb. and Guy's; Alice C. N. Swanston, Royal Free; M. M. Syddiq, Punjab; Barbara M. G. Taylor, Leeds and West London; H. W. Thomas, London; D. M. Thomson, St. Bart.'s; G. L. B. Thurston, Guy's; Lilian E. Tracey and Sarah C. B. Walker, Royal Free; T. P. Ward, Camb. and St. Thomas's; J. T. Watkins, Cardiff; C. P. B. Wells, Univ. Coll.; P. R. Wheatley, Guy's; F. E. Wheeler, St. Bart.'s; J. I. Wilson, Univ. Coll.; C. R. Wright, Liverpool; and I. Zieve, Guy's.

Diplomas in Public Health were conferred (jointly with the Royal College of Surgeons) upon the following 8 candidates:—

B. Haring, William Hartston, Mary C. im Thurn, M. Jafar, Lilian P. James, K. N. Mawson, G. P. Phadke, and V. V. Puri

University of Cambridge

The Smyth Exhibition, of an annual value of £30, is offered to an open scholar or exhibitioner of Corpus Christi College who intends to read for a medical degree. When funds permit a further Smyth exhibition may be offered to another undergraduate reading medicine.

University of London

At a meeting of the senate on Oct. 25th it was resolved that on the occasion of the celebration of foundation day, 1933, the honorary degree of doctor of science should be conferred, among others, on Sir Thomas Barlow, F.R.S., consulting physician to University College Hospital. The title of professor of malarial studies in the London School of Hygiene and Tropical Medicine was conferred on Sir Samuel Rickard Christophers, lately director of the Central Research Institute at Kasauli, who has been working at the School as Leverhulme research Fellow with a grant from the Medical Research Council; and the title of reader in pathology was conferred on Dr. F. A. Knott, assistant lecturer in bacteriology in Guy's Hospital medical school. Sir Ernest Graham-Little was re-elected chairman of the council for external students for the year 1933–34.

Society of Apothecaries of London

At recent examinations the following candidates were successful:—

Surgery.—G. C. Canaval, Univ. of Bristol; E. E. Evans, Guy's Hosp.; E. M. F. O'Donovan, Royal Free Hosp.; and S. E. Roberts, Guy's Hosp.

Medicine.—K. W. Bruce, Univ. of Durham; H. L. Canaval, Univ. of Bristol; N. C. Lendon, St. Mary's Hosp.; D. A. Smith, Univ. of Cambridge and St. Mary's Hosp.; G. L. R. Tapsall, St. Mary's Hosp.; P. D. Thomas, Univ. of Cambridge and St. George's Hosp.; T. von Haebler, Royal Free Hosp.; and J. P. Walsh Conway, Charing Cross Hosp.

Forensic Medicine.—G. C. Canaval, Univ. of Bristol; R. F. Fleming, St. Mary's Hosp.; E. M. F. O'Donovan, Royal Free Hosp.; B. D. Sachdeva, Guy's Hosp.; A. L. L. Silver, Univ. of Oxford and London Hosp.; and J. P. Walsh Conway, Charing Cross Hosp.

Midwifery.—P. C. Alexander, Univ. of Oxford and Guy's Hosp.; A. H. L. Baker, Univ. of Oxford and St. Mary's Hosp.; G. W. Hardy, St. Mary's Hosp.; W. C. Heunis, London Hosp.; M. T. Hirst, King's Coll. Hosp.; E. G. Houghton, Univ. of Cambridge and St. George's Hosp.; D. P. King, Univ. of Cambridge and Guy's Hosp.; S. Krishnan, Univ. of Sheffield; H. J. Ripka, London Hosp.; H. W. Smithies, St. Mary's Hosp.; and P. H. Willcox, Univ. of Cambridge and St. Mary's Hosp.

The following candidates, having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery, and midwifery:—

K. W. Bruce, G. C. Canaval, R. F. Fleming, E. M. F. O'Donovan, P. D. Thomas, and T. von Haebler.

Aberdeen University Club, London

The ninetieth half-yearly dinner of this club will be held at the Trocadero Restaurant, Piccadilly, W., at 7 for 7.30 P.M., on Thursday, Nov. 23rd, under the chairmanship of Mrs. K. E. Trail. The secretary's address is 9, Addison-gardens, W.14.

Fellowship of Medicine and Post-Graduate Medical Association

Four lectures, arranged by the London Child Guidance Clinic, will be given on Nov. 13th, 15th, 20th, and 22nd, at B.M.A. House, Tavistock-square, London, W.C. The first, on child psychiatry and its bearing on behaviour, will be given by Dr. William Moodie (at 8.30 P.M.). An advanced course in urology will be given at St. Peter's Hospital for Stone from Nov. 6th to 18th, and during the week-end, Nov. 18th and 19th, there will be one in gynæcology at the Samaritan Hospital for Women. A fortnight's course in diseases of the chest will be held at the City of London Hospital, Victoria Park, from Nov. 13th to 25th, and a course in venereal disease at the London Lock Hospital from Nov. 13th to Dec. 9th. The subjects of other forthcoming courses include proctology at St. Mark's Hospital (Nov. 20th to 25th); rheumatism at the British Red Cross Clinic (Tuesdays and Thursdays from Nov. 21st to Dec. 7th); diseases of infants at the Infants Hospital (Nov. 27th to Dec. 9th); and dermatology at Blackfriars Skin Hospital (Nov. 27th to Dec. 9th). Further particulars may be had from the secretary of the Fellowship, 1, Wimpole-street, W.1.

St. Mary's Hospital Medical School

The King, accompanied by the Queen, will open the new medical school of St. Mary's Hospital, London, on Tuesday, Dec. 12th.

Industrial Health Research Board

The Medical Research Council have appointed Dr. E. P. Cathcart, F.R.S., regius professor of physiology in the University of Glasgow, to be chairman of this board in succession to Sir Arnold Wilson. They have also appointed Prof. Cyril Burt, D.Sc., and Miss Hilda Martindale to be members of the board in succession to Sir John Parsons, F.R.S., and Miss M. Ritson.

National Council for Mental Hygiene

The third biennial conference on mental health, organised by this council, will open at the Caxton Hall, Westminster, with a meeting at 8.30 P.M. on Wednesday, Nov. 22nd. Prince George, the president, will take the chair. The address of the council is 78, Chandos House, Palmer-street, London, S.W.1.

Child-Study Society, London

Dr. J. Norman Glaister will take the chair at a meeting of this society, to be held at the society's new address, 29, Tavistock-square, W.C.1, at 6 P.M. on Thursday, Nov. 9th. Mrs. Marjorie Abbott will speak on Toys and the Child's Development.

Prof. Pauchet in Leeds

To-day, Friday, Nov. 3rd, at 5.30 P.M., Dr. Victor Pauchet, professor of surgery in the University of Paris, will address the University of Leeds Medical Society, and at 8.30 P.M. the Leeds and West Riding Medico-Chirurgical Society. Both meetings will be held in the General Infirmary.

College of Physicians of Philadelphia

Alvarenga Prize.—The next award of this prize, amounting to about 300 dollars, will be made on July 14th, 1934. Essays on any subject in medicine will be considered provided they have not appeared in print and have not been presented elsewhere in competition for a prize. They must be in prescribed form, and must be received by the secretary at 19, South 22nd-street, Philadelphia, by May 1st. The prize for 1933 was awarded to Dr. Harry Shay and Dr. J. Gershon Cohen, of Philadelphia, for their essay on experimental studies in gastric physiology in man.

Liverpool Dental Hospital

Owing to the large number of patients awaiting denture treatment, and the lack of money, equipment, and staff, the committee have for the time being closed the dental appliance department to new patients. The attendance of patients has increased so considerably that in September they exceeded 8000, an increase of 793 over the same month last year. More than 1100 patients are awaiting dentures, mostly double, and it will be impossible to complete their treatment in less than a year. It is officially stated that the chief cause of the congestion is the introduction of a system of payment by instalments. The charge for a set of teeth is £4, which may be paid for by instalments of 1*s.* 2*d.* weekly.

Jewish Health Organisation of Great Britain

This organisation has arranged a course of public lectures which will be given on Saturdays at 8.30 P.M., from Nov. 18th to Jan. 13th, in the Whitechapel Art Gallery, High-street, Whitechapel, London, E. The speakers will include Dr. Leonard Williams (digestion), Dr. D. H. Geffen (cleanliness and good citizenship), Dr. Lionel Goitein (minor neuroses and major consequences), Dr. Bertram Nissé (the nature, prevention, and treatment of rheumatism), Dr. Stella Churchill (the prevention of maternal mortality), Dr. A. R. Abelson (new methods in first-aid), Mr. Harold Kisch (the common cold), Dr. W. J. O'Donovan (occupational sickness and diseases), and Dr. Killick Millard (the problem of the slums). The address of the organisation is Woburn House, Upper Woburn-place, W.C. 1.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, Nov. 7th.—5.30 P.M., ORTHOPÆDICS. (Cases at 4.30 P.M.) Mr. C. Hope Carlton: 1–4. Fracture of the Os Calcis Treated by the Böhler Method. Mr. Ralph Brooke: 5. Pathological Fracture of the Humerus. 6. Pneumatic Splint for Treating Fractured Clavicles. Mr. R. Broomhead: 7. Lantern Slides of X Ray Photographs of a Case of Sacro-iliac Dislocation reduced by Hoke Traction. Mr. G. R. Girdlestone: 8. Radiograms of a Case of Calcification in the Semilunar Cartilages of the Knee. Mr. J. M. Gibson: 9–10. Arthritis of Hip for Diagnosis. Dr. A. Feiling: 11. Unilateral Spinal Arthritis with Compression of Nerve-roots. Mr. W. Eldon Tucker: 12. A Family with Congenital Absence of the Femoral Head. Other cases will be shown.
WEDNESDAY.—5 P.M., SURGERY: SUBSECTION OF PROCTOLOGY. Mr. W. Ernest Miles: Some Experiences in Rectal Surgery. (Presidental address.)
FRIDAY.—5.30 P.M., CLINICAL. (Cases at 4.30 P.M.) Dr. Terence East: 1. Hæmolytic Anæmia with Acholuric Jaundice and Normal Erythrocyte Fragility time, treated by Splenectomy. Dr. Philip Ellman: 2. Generalised Bronchiolectasis with Bronchiectasis of the Left Base. Other cases will be shown. 8.30 P.M., OPHTHALMOLOGY. (Cases at 8 P.M.) Papers. Mr. A. C. Hudson: Metastatic Carcinoma of the Choroid. Miss Ida Mann: Demonstration of Congenital Abnormalities of the Iris and Lens. Cases will be shown.

HARVEIAN SOCIETY OF LONDON, Town Hall, Paddington green, W.
THURSDAY, Nov. 9th.—8.30 P.M., Prof. L. S. P. Davidson: Therapeutics of Anæmia.

SOUTH-WEST LONDON MEDICAL SOCIETY, Bolingbroke Hospital, Wandsworth Common.
WEDNESDAY, Nov. 8th.—9 P.M., Dr. E. Ulysses Williams: Will an X Ray Examination be Helpful?

WEST KENT MEDICO-CHIRURGICAL SOCIETY.
FRIDAY, Nov. 10th.—8.45 P.M., Mr. W. E. Tucker: Athletic Injuries Manipulation.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY, 11, Chandos-street, W.
THURSDAY, Nov. 9th.—8.30 P.M., Dr. C. M. B. Brown: Relationship Between Psychology and General Medicine.

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY, Royal Northern Hospital, Holloway-road, N.
THURSDAY, Nov. 9th.—9 P.M., Mr. W. B. Gabriel: Clinical Demonstration.

EUGENICS SOCIETY.
TUESDAY, Nov. 7th.—5.30 P.M. (in the Rooms of the Linnean Society, Burlington House, W.), Dr. H. L. Gordon: Amentia in the East African Native, Considered Psychiatrically and Socially.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, Nov. 7th and following THURSDAY.—5 P.M., Sir H. Rolleston: History of the Endocrine Organs. (FitzPatrick lectures.)

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn-fields, W.C.
MONDAY, Nov. 6th.—5 P.M., Mr. R. Davies-Colley: Specimens illustrating Diseases of the Breast.
FRIDAY.—5 P.M., Mr. Davies-Colley: Specimens illustrating Fibrocystic Disease and Innocent Tumours of Bone.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Nov. 6th, to SATURDAY, Nov. 11th.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Evening M.R.C.P. Course. Tues. and Thurs., at 8 P.M.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Course in Medicine, Surgery, and Gynæcology. All day.—ST. PETER'S HOSPITAL FOR STONE, Henrietta-street, W.C. Course in Urology for advanced post-graduates. All day.—PANEL OF TEACHERS. Individual clinics in various branches of Medicine and Surgery are available daily by arrangement with the Fellowship of Medicine.—Courses, &c., arranged by the Fellowship of Medicine are open only to Members and Associates.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Nov. 10th.—4 P.M., Mr. N. Asherson: Indications for Opening of the Mastoid.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL Post-graduate Lectures.
WEDNESDAY, Nov. 8th.—4 P.M., Mr. E. Rock Carling: Surgery of the Sympathetic System.

ST. PAUL'S HOSPITAL, Endell-street, W.C.
WEDNESDAY, Nov. 8th.—4.30 P.M., Mr. C. H. Mills: Some Interesting Urological Cases with Demonstration, Pathological Specimens, and Radiograms.

CHARING CROSS HOSPITAL MEDICAL SCHOOL, Chandos-street, W.C.
SUNDAY, Nov. 5th.—10.30 A.M., Mr. C. Jennings Marshall: Common Disorders of Micturition. 11.45 A.M., Mr. R. A. Fitzsimons: Infections of the Hand.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY, Nov. 9th.—4.30 P.M., Dr. W. P. H. Sheldon: Prevention of Diseases in the Pre-School Age. 9 P.M., Mr. V. E. Negus: Cancer of the Larynx.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Nov. 6th.—3.30 P.M., Dr. Kinnier Wilson: Disorders of Cerebral Functions: Aphasia, Apraxia, &c.
TUESDAY.—3.30 P.M., Dr. Denny-Brown: Spinal Reflexes.
WEDNESDAY.—3.30 P.M., Dr. Collier: Clinical Demonstration.
THURSDAY.—3.30 P.M., Dr. Walshe: The Motor System.
FRIDAY.—3.30 P.M., Dr. Bernard Hart: The Psychoneuroses.
Out-patient Clinic each day at 2 P.M.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Nov. 7th, and following THURSDAY.—5 P.M., Dr. J. E. M. Wigley: Tuberculosis Cutis.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.
WEDNESDAY, Nov. 8th.—4 P.M., Dr. C. M. Wilson: Ketogenic Diet.

INSTITUTE OF HYGIENE, 28, Portland-place, W.
WEDNESDAY, Nov. 8th.—3.30 P.M., Dr. T. Izod Bennett: Anæmia and Diet.

ROYAL INSTITUTE OF PUBLIC HEALTH, 23, Queen-square, W.C.
WEDNESDAY, Nov. 8th.—4 P.M., Dr. J. H. H. Williams: Citizenship and Tuberculosis.

ANCOATS HOSPITAL, Manchester.
THURSDAY, Nov. 9th.—4.15 P.M., Mr. P. G. McEvedy: Mistakes in Diagnosis.

MANCHESTER HOSPITAL FOR CONSUMPTION AND DISEASES OF THE THROAT AND CHEST, Hardman-street, Deansgate, Manchester.
WEDNESDAY, Nov. 8th.—4.30 P.M., Mr. E. S. B. Hamilton: Dysphagia.

LEEDS GENERAL INFIRMARY.
TUESDAY, Nov. 7th.—4 P.M., Mr. H. W. Symons: Demonstration of Surgical Cases.

GLASGOW Post-graduate Lectures.
WEDNESDAY, Nov. 8th.—4.15 P.M. (at the Royal Infirmary), Dr. J. Henderson: Medical Cases.

MANCHESTER ROYAL INFIRMARY.
TUESDAY, Nov. 7th.—4.15 P.M., Mr. Wilson H. Hey: Hyper- and Hypo-thyroidism.
FRIDAY.—4.15 P.M., Mr. P. R. Wrigley: Demonstration of Surgical Cases.

Births, Marriages, and Deaths

BIRTHS

FORSTER.—On Oct. 23rd, at Jerusalem, the wife of Dr. E. D. Forster, Hebron, Palestine, of a daughter.

MARRIAGES

BALGARNIE—PATTISON.—On Oct. 23rd, Wilfred Balgarnie, O.B.E., F.R.C.S., of Hartley Wintney, to Ruby Ethel Pattison, of Hook, younger daughter of the late Captain Pattison, of the Eastern Telegraph Company.

DEATHS

BOOTH.—On Oct. 25th, as the result of a motor accident near Darlington, Lionel Hethorn Booth, M.R.C.S., L.R.C.P.
BRAY.—On Oct. 30th, Colonel George Arthur Theodore Bray, D.S.O., R.A.M.C. (retired).
GAIRDNER.—On Oct. 20th, at Ayr, after a brief illness, Eric Dalrymple Gairdner, D.S.O., M.B., Ch.B.
HOUSTON.—On Oct. 29th, at Fairhazel-gardens, Hampstead, Sir Alexander C. Houston, K.B.E., C.V.O., F.R.S., LL.D., M.B., D.Sc., Director of Water Examinations, Metropolitan Water Board.
HUTCHISON.—On Oct. 20th, while on a visit to Evesham, Worcestershire, Arthur Jaffray Hutchison, M.A., M.B., C.M.
IRELAND.—On Oct. 23rd, at a London nursing-home, John Stewart Algeo Ireland, B.A., M.B., B.Ch., T.C.D., aged 73 years.
KNIGHT.—On Oct. 29th, at Brighton, following an accident, Elizabeth Knight, M.B., of Gainsborough-gardens, Hampstead, N.W., aged 64 years.
NEWMAN.—On Oct. 24th, at Godalming, Arthur Joshua Newman, M.R.C.S., aged 81.
THOMPSON.—On Oct. 28th, suddenly, Dr. Arthur Henry Thompson, of Harley-street, W.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

PADDINGTON GREEN CHILDREN'S HOSPITAL.—Last week Lady Owen laid the foundation-stone of extensions to this institution, which include eight new bedrooms for nurses.

NOTES, COMMENTS, AND ABSTRACTS

CHANGES IN WOMEN THEMSELVES BETWEEN 1830 AND 1930 *

By RAY STRACHEY

CHAIRMAN OF THE EMPLOYMENT COMMITTEE, LONDON AND NATIONAL SOCIETY FOR WOMEN'S SERVICE

WE are familiar with the idea of physical evolution. We know a lot about the disused parts of our bodies which we have developed away from. We sit without a thought upon our rudimentary tails, and in the physical world we no longer admit the idea that the human body will never change. Why should we not do the same for the human spirit? I grant you that the period of change may be very slow. If there is any kind of development in human nature going on it is probable that it will move along unevenly. There will be periods of stagnation and periods of activity; and if that is so no one can deny that, as regards the white races at least, the last hundred years are likely to have been a favourable time for female development and alteration; and if for females, then for the whole race.

THE RESULTS OF NEGLECT

I believe that one of the important reasons why civilisation has developed so slowly, and why human nature has remained so largely unaltered during the centuries we know anything about, is just this neglect of women. With few and rare exceptions they have been virtually shut out from what was going on in the world, excused from the toil of thought and the burden of responsibility, and carefully trained to concern themselves only with the little things of life. The one thing of real importance to the race which has been in their province has been the early training of children, and this they have had to do more or less by the light of nature, without applying to it any of the knowledge or the experience which, in other directions, has been painfully acquired and stored up for successive generations. The consequence of this has been, of course, that each new generation has started at the level of the women and has not come into contact with the advances of civilisation until the years of infancy have passed, by which time primitive instincts have been reinforced by habits and assumptions based on a low cultural and intellectual level. And in consequence each boy has had to make up for himself all the leeway, so to speak, between the women's and the men's level before he can make any further advance.

It is really more important to the race to improve women in any generation than to improve men, because they have the opportunity of passing that improvement on to the next generation at the earliest and most impressionable stage of life. The Jesuits used to say that if they could have a child till he was 7 he was theirs for life, but with that exception few people seem to have paid much attention to the very early education of children. Recently, as we all know, it has sprung into the limelight, and the psycho-analysts go so far as to maintain that what happens before the age of 4 is what fixes, and perhaps distorts, the whole of subsequent life. I do not propose to discuss that, but I do want to point out that this concern with infant education coincides with the advance in the position of women. It was not until they began to count in the world that science or education began seriously to tackle these problems. This is an entirely natural thing, of course, but it is interesting. It is one of the first ways in which the advance of women may be expected to be of value to the race, and to speed up the development of human nature.

The core of my subject, however, is the question whether women have changed at all in consequence of the obvious and widespread changes which have taken place in their position in the last 100 years. It is no answer to say that they have more opportunities for education, and more freedom of action. The point is, have these opportunities and freedoms altered their actual natures? I propose to confine my generalisations to the middle classes in this country.

YOUNGER WOMEN

Are the young ladies of to-day different from the young ladies of 1830, or are they just the same creatures, differently dressed? The outstanding characteristics of the young women of to-day appear to be self-reliance, energy, pluck, a certain hardness of fibre, realism, outspokenness, tenacity, and ambition. This list of virtues does not correspond at all with the Victorian idea of a young lady. We all know that she was timid, clinging, delicate, easily influenced, unselfish, and afraid of mice. But are the young women of to-day really as adamantine as they appear? And were the Victorians really as soft as they were supposed to be? There are, of course, modern girls who hate independence and responsibility, who hanker for a passive, sympathetic, parasitic way of life, and to whom sustained exertion and resistance come hard. What is more, I have noticed that this kind of girl is immediately popular with young men, who seem to be attracted at sight by the traditionally feminine qualities. This seemed to me interesting, and I think it tends to strengthen my belief that the other kind must be a natural and not an artificial product. For if there were not something very strong driving them towards the modern ideal (something stronger than a new fashion) they would not hold out against this marked preference of young men for the old-fashioned type. For, however girls may have changed, and whatever new things there may be about them, the desire to attract men has certainly not abated. It would be a foolish person who maintained that emancipation had made any impression at all upon the biological aspect of human nature.

On the whole, however, I remain of the opinion that modern young women tend to be of a sturdy and rather tough kind, and that the typically clinging vines among them are the exceptions. But were Victorian girls really what they were supposed to be?

Neither fiction nor biography appear to me to provide satisfactory evidence, nor do recollections of what has been told to me by the women of my grandmother's generation, or of the girls I was at school and college with. These were, on the whole, miserable at home, they disliked their fathers, and they wished they had been born of the other sex. Psycho-analysts, no doubt, could deduce something of their fundamental natures from these three emotions; but the only deductions I can make concern not their natures but the circumstances of their lives.

Their homes did not give them the sort of life they wanted; their fathers were the restraining authorities and the paymasters, and they saw their brothers and all contemporary boys enjoying the freedoms they could not have. It was in essays about young women, and the tracts and lectures addressed to them which were written in such abundance during the nineteenth century, that at last I found the Victorian miss in her completeness. These have the authentic ring; but in exhortation, not in evidence. If it proves anything about the real natures of the young ladies to whom it was addressed, I am afraid it proves that they were hypocrites, not ninnies.

A series of works on Female Duty, published in 1839, 1842, 1843, and 1844, throw some light on the character of the young ladies for whom Mrs. Ellis was writing. The whole scheme of life which she was upholding demanded that women should be content to be inferior, but evidently they were in need of being plainly reminded of the fact year by year as

* Abridged from the Fawcett lecture, delivered at Bedford College, London, on Nov. 2nd.

a new generation left school. And what is more they had to be offered some compensation. Mrs. Ellis decided that the way to make young ladies swallow the pill of deficiency of power was to tell them that they had something even more effective, namely *influence*.

As my last resort, I tried to get evidence from the essays which professed actually to describe young women at different dates. They gave me some curious information. Just listen to this:

"Young women of to-day live in a perpetual round of amusement; their three rules are to read novels, dance, and live in idleness. Twenty years ago no young woman would have ventured outside her parents' house without her mother; but now young girls go about alone by day and night in perpetual freedom; they read the most improper books, and the foam of a poisonous philosophy falls from their lips."

You would think, from the sound of this, that it was written by Dean Inge; as a matter of fact its date is 1800.

Now here is another, 83 years later in date, that is, exactly 50 years ago. It is taken from "The Girl of the Period," by Mrs. Lynn Linton:

"The girl of the period is a creature who dyes her hair and paints her face, a creature whose sole idea of life is fun, whose sole aim is unbounded luxury, and whose dress is the chief object of such thought and intelligence as she possesses. . . Nothing is too extravagant, nothing too exaggerated for her vitiated taste. . . No one can say of the modern English girl that she is tender, loving, retiring or domestic. . . The girl of the period does not marry easily. Men are afraid of her, and with reason. All men whose opinion is worth having prefer the simple and genuine girl of the past, with her tender little ways and pretty bashful modesties to this loud and rampant modernisation."

The discovery of such similar descriptions and complaints at such different dates really brought me to a standstill. I concluded that there is no reliable evidence about what young women were really like 100 years, or even 50 years ago. Nevertheless I have formed these conclusions, and may as well give them to you.

I believe that women, even during the darkest age of subjection, were strong and independent by nature. I believe we have always been the tough sex, and the unsentimental sex. I am not sure that the immense weight of the contrary convention which has been piled up on top of us is not a tribute to this fact. It needed, perhaps, all that to keep us down. And so I believe that in natural equipment the young women of to-day are not much different from their grandmothers. In short, I don't believe that emancipation, as yet, has changed the natures of women.

OLDER WOMEN

Up to now I have been considering young women. When we look at middle-aged or old women, and consider health as well as temperament, we find evidence of change in plenty. All the sources from which I have sought this inconclusive evidence about young women yield quite definite and clear results as to older women. The novels, the memoirs, the exhortations, and above all the letters of the Victorian period leave no doubt at all that women grew middle-aged and old very rapidly, and that they suffered to an appalling extent from ill-health. Partly, no doubt, this was due to the absence of exercise and fresh air in childhood, partly to ridiculous clothing, and partly to the depressing effect of having nothing to do. But the great cause, and the chief destroyer of women was the prevailing habit of expecting them to bear an enormous number of children in quick succession. There was nothing very unusual in the middle of the last century in families of ten, or even twelve; and we must remember that a living family of ten probably meant at least four or five other confinements for the mother. The infant mortality-rate among the middle classes was very high. There is no doubt at all that, once they were married, women themselves were usually submerged in the process of breeding, and only emerged at the end worn out and broken in health.

I am putting this rather strongly, and perhaps over-stating the case. Some women were robust enough to stand up against this heavy strain, and to remain themselves in spite of bearing a dozen children. Others, of course, escaped by dying when their first child was born. And others remained unmarried. But on the whole it was the normal expectation that a woman would spend the years between 18 and 40 in repeated pregnancies—even if she had no living children to show for it in the end. And since women did, in fact, spend and break their lives upon prolonged and often fruitless maternity, we cannot deny that they themselves, their lives, thoughts, feelings, and bodies must have been conditioned by this function.

And nowadays it is not so. I do not propose to discuss causes, or explanations, or merits, or expediencies. For my purpose all that is needed is the fact. Nowadays the women of the middle classes rarely have more than two or at most three children. Hygiene and medicine and gynæcology have progressed so far that infant mortality among the middle classes is very low indeed. The women of this generation do not become submerged under the business of childbearing, and do not spend 20 years of broken and precarious health. They space out their children, and bring them alive into the world, and they are themselves better, and not worse in health for bearing them. And this is a very fundamental change indeed. The maternal function is, I do not doubt, the most essential part of a woman's nature. In so far as the changes of the last 100 years have released women from the fear and the dread of that function, and have turned it from a burden which destroyed them into a labour in which they can rejoice, I think we must maintain that women themselves have been changed, very greatly to their gain.

MURRAY MADE ACCESSIBLE

THE great dictionary of the English language which gave the late Sir James Murray and his collaborators nearly half a century of continuous labour, was followed last spring by the Shorter Oxford English Dictionary, which took another 30 years or so to prepare. The two stout quarto volumes, printed in triple column and containing nearly 2500 pages, made Murray available to a far wider circle, and indeed serves the purpose of its great parent to all but the pure specialist. The Shorter Dictionary may be regarded as that rare thing, the perfect general consultant; and now Messrs. George Newnes, Ltd., have made the Shorter Dictionary accessible to every household by reissuing it in 45 weekly parts at the price of one shilling a part. Numbers of people will want it to assist them in the pastimes of crossword puzzles and acrostics which have done so much to develop interest in words as counters. But the dictionary does what no other has attempted; it traces the history of each word, its origin, when it was first used in a new sense, and by whom. From the present fascicle the reader can learn that *altruism* was first recognised in 1853; that the phrase "all right" became blended into one word *alright* in 1893; and that the adjective meaning gaseous was first used in 1902 for an overhead wire serving the listener-in. If he is curious he may note that up to 1623 the word *algebra* referred to the surgical treatment of fractures, and that *ally* or *alley* is a recognition since 1720 in schoolboy vocabulary that the first marbles were made of alabaster. Each instalment of 56 pages will, no doubt, provide more than sufficient entertainment for seven winter evenings. The 45 weekly parts may be obtained of any newsagent or bookseller, or post free (1*s.* 2*d.*) from the publishers, 8, Southampton-street, London, W.C. 2.

AN ART DISCOVERY AT GUY'S HOSPITAL

THE librarian of the Courtauld Institute of Art (University of London) writes: "In the last number of THE LANCET there appeared a note on a fruit and flower painting at Guy's Hospital by John Teal Cooper, quoting from a letter from Prof. W. G. Constable of this Institute. Prof. Constable has now sailed for Canada, but in the meanwhile we have found out that the problem of the identity of this painter is even more complicated than we originally thought.

"There were apparently two men of the name of Cooper who both died in 1743, and who are both said to have painted fruit and flowers. One was, according to the *Daily Advertiser* of 1743, quoted in THE LANCET last week, John Teal Cooper, who was 45 years old when he died; the other was Joseph Cooper, born at Burford, who was 61 years old when he died. The *Daily Advertiser* referred to John as 'the Michael Angelo de Campidolo of his age.'

"Horace Walpole, however, mentions a Cooper (without a Christian name) but refers to him as having imitated Michael Angelo da Caravaggio in painting fruit and flowers, and mentions that he died towards the end of 1743. Hence arose the confusion between Michael Angelo da Caravaggio and Michael Angelo de Campidolo. The mistake was Walpole's, for, although forgotten now, Michael Angelo de Campidoglio was at that time quite a well-known painter of fruit and flowers. A Joseph Cooper is known to exist, as there is a mezzotint signed by him in the British Museum. Whether he ever painted fruit and flowers is doubtful. He is mentioned in Thieme Becker's lexicon as a fruit and flower painter, and it is possible that the writer of that notice, who also was misled by Walpole, erred as we did and, with insufficient proof, attributed to Joseph, John's fruit and flower paintings."

A MANIAC'S STORY

IN the last few years a number of retrospective accounts of an attack of mental disorder have been published. Some of them have been valuable as detailed material for the psychiatrist or as arguments in the cause of mental hygiene; others are suspect because of the falsification, doubtless unintentional, which the experiences have undergone. The latter group would include this book, a book entitled The Maniac,[1] first published in 1909 and now reprinted. What is described does not correspond to any type of mental disorder, and the dramatic heightening and arrangement of the detail make it unsuitable for serious study. As a painful story with a moral it has merit.

BIRTH CONTROL CLINICS.—A lecture on the Theory and Practice of Contraception will be given to medical students by Dr. L. C. Butler, on Friday next, Nov. 10th, at 6 P.M., at the Walworth Women's Welfare Centre, 153A, East-street, S.E. Practical demonstrations will be given on Friday, Nov. 17th, at 6 P.M. and 7 P.M., and on Friday Nov. 24th, at 6 P.M. and 7 P.M. These lectures will be open to students who have completed their gynæcological courses, and those who wish to attend them should communicate as soon as possible with the secretary of the Centre, stating which day and time they select.—A meeting will be held in connexion with the North Kensington Women's Welfare Centre on Tuesday, Nov. 14th, at 5 P.M., at 14, Holland Park-road, W.14, when Dr. Margaret Rorke and Dr. Helena Wright, medical officers at the Centre, will describe the work of the clinic. Mr. J. A. L. Duncan, M.P. for North Kensington, will preside. The subscribers to the clinic are asked to arrive at 4.15 P.M. to receive the annual report and statement of accounts.

[1] The Maniac. A Realistic Study of Madness from the Maniac's Point of View. Anonymous. London: Watts and Co. Pp. 259. 7s. 6d.

Appointments

WIGFIELD, A. S., M.B., B.S. Lond., has been appointed Certifying Surgeon, under the Factory and Workshop Acts, for Buntingford, Hertford.

Vacancies

For further information refer to the advertisement columns

Birmingham and Midland Eye Hospital, Church-street.—Res. Surg. O. £200.
Birmingham General Hospital.—Res. Surg. O. £180.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.
Bristol, Southmead Municipal Hospital.—Asst. Res. M.O. £200.
Bristol University.—Chair of Anatomy.
Cancer Hospital, Fulham-road, S.W.—Res. M.O. £200.
Cheltenham General and Eye Hospitals.—H.S. £300.
City of London Hospital for Diseases of Heart and Lungs, Victoria Park, E.—Asst. Surg.
Dorset County Council.—County M.O.H. £1100. Also Two Asst. M.O.'s. Each £500.
Fulham Hospital, St. Dunstan's-road, Hammersmith, W.—Res. Med. Supt. £1000.
Guildford, Royal Surrey County Hospital.—H.S. £150.
Hornchurch Children's Home, Hornchurch, Essex.—Part-time M.O. £200.
Hull Royal Infirmary.—Hon. Physician.
Ilford, King George Hospital.—Hon. Ophthalmic Surgeon. Also Res. M.O. £250.
Kettering and District General Hospital.—Res. M.O. At rate of £200.
King's Lynn, West Norfolk and King's Lynn General Hospital.—H.P. At rate of £125.
Lambeth Hospital, Brook-street, Kennington, S.E.—Asst. M.O. £350.
London University.—Sir William Dunn Chair of Pathology at Guy's Hospital. £1400.
Middlesex Hospital Medical School, W.—Two Surg., One Obstet., and One Otological Registrarships. Each £300.
Miller General Hospital, Greenwich-road, S.E.—Cas. O. and Out-patient Officer. Each at rate of £150. Also H.S. and H.P. Each at rate of £100.
Poole, Dorset, Cornelia and East Dorset Hospital.—Hon. Asst. Anæsthetist.
Princess Louise Kensington Hospital for Children, St. Quintin-avenue, N. Kensington.—Part-time Pathologist and Bacteriologist. £250.
Prison Medical Service.—M.O. £505 7s.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Two Res. Anæsthetists. Each at rate of £100. Also Asst. Res. M.O. At rate of £80.
Queen's Hospital for Children, Hackney-road, E.—Physician to the Skin Dept. H.P. and Cas. O. Each at rate of £100. Also Clin. Asst. to Orthopædic Dept. 5s. per attendance.
Reading, Royal Berkshire Hospital.—Resident Anæsthetist. £150.
Rochester, St. Bartholomew's Hospital.—Res. Surg. O. At rate of £225.
Royal Free Hospital, Gray's Inn-road, W.C.—Hon. Anæsthetist. Also Second Asst. Surg. to Ear, Nose, and Throat Dept.
St. Leonard's Hospital, Hoxton-street, Shoreditch, N.—H.P. At rate of £80.
St. Mary Islington Hospital, Highgate-hill, N.—Asst. M.O. £250.
Salvation Army Mothers' Hospital, Lower Clapton-road, E.—Sen. and Jun. Res. M.O.'s. At rate of £150 and £80 respectively.
Southampton County Borough.—Clin. Tuber. O. and Asst. M.O.H. £750.
West Bromwich, Hallam Hosp.—Two Res. H.P.'s. At rate of £200.
West London Hospital, Hammersmith-road, W.—Cas. O. £250.
Westminster Hospital, Broad Sanctuary, S.W.—H.S. to Ear, Nose, Throat and Eye Dept. At rate of £104.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Ulceby, Lincoln, and Bicester, Oxford.

DUBLIN UNIVERSITY BIOLOGICAL ASSOCIATION.—The opening meeting of this session was held last Saturday in Trinity College, when the president-elect, Dr. Geoffrey Bewley, read an address on pulmonary tuberculosis amongst the out-patients. A discussion followed, in which Dr. E. T. Freeman, Dr. J. A. Harbison, Dr. T. G. Moorhead, and Dr. J. W. Bigger took part.

MILK FOR HOSPITALS.—Statements having been made that, under the new marketing scheme, hospitals would have to pay the full retail price for their milk-supplies, the Milk Marketing Board has issued a statement that unless a hospital's daily purchases of milk are very small "such purchases will be regarded as semi-wholesale transactions for which the Board has not prescribed any fixed price. Consequently milk may be bought by hospitals and other similar institutions in fairly large quantities at any price between the wholesale price and the retail price for the region or district concerned."

ADDRESSES AND ORIGINAL ARTICLES

A PSYCHOLOGICAL REGARD OF MEDICAL EDUCATION *

By CHARLES S. MYERS, C.B.E., M.D., Sc.D. CAMB., HON. D.Sc. MANCH., F.R.S.
PRINCIPAL OF THE NATIONAL INSTITUTE OF INDUSTRIAL PSYCHOLOGY

My position here to-day as an industrial psychologist is, I feel, not unlike that in which I often find myself when asked by an employer how, in ignorance of all technical details, I can be expected to increase the efficiency of a particular business. This criticism the industrial psychologist meets by his contention that wide previous experience enables him the better to realise and to remedy defects in analogous situations; and that, just as commonly the outsider sees most of the game, so the industrial psychologist can often recognise and remedy defects which tend to be overlooked by the expert who has lived in their midst. I wonder whether my acquaintance with general and applied psychology and my distance from medical training and practice may not help me to throw light on the problem of medical education.

For the outlook of the industrial psychologist is a singularly wide one. He does not deal merely with industry and psychology: he is concerned with every aspect of the human factor throughout every kind of occupational life. He is engaged not only in investigating and improving all kinds of business and professional working conditions that affect the mental and bodily health and the happiness and efficiency of the worker, but also in studying the best methods of his training, his recruitment and his selection, and in helping him even earlier to make such a choice of a career as accords with his innate mental and physical abilities, his acquired knowledge, his temperament, character and interests, and his social and financial position.

Different Kinds of Ability

Of innate mental abilities or aptitudes there appear to the applied psychologist to be three kinds: special, group, and general. The last are common to the exercise of all mental processes, though varying in them widely in degree, whereas the first are each particular to some one kind of mental process. The most important general ability is known as general intelligence—the ability to discern and to utilise relevant relations, whether between ideas, written symbols, or concrete objects. Now two of the most obvious essentials for entry into the medical profession are at least a minimal amount of general intelligence and at least a minimal amount of what we may usefully term scientific ability—the ability to employ scientific methods and to appreciate scientific evidence. Within the medical profession the field of possible occupations is so wide that opportunities are afforded for unusual excess or defect in almost every other kind of mental ability and in almost every trait of personality. The student who is temperamentally averse from close and continual social intercourse may gravitate towards medical research or to preventive medicine; if he excel in manual dexterity, he may specialise in surgery; should his interests lie predominantly in the young, in the poor, in the workings of the mind, or in country life, he may satisfy them by engaging in corresponding medical practice. But unless he be endowed with at least the required minimum both of general intelligence and of scientific ability, no applicant for vocational guidance can be advised to enter as a medical student; high general intelligence being useless to him, if it be conjoined only with literary, musical, or other special abilities, and adequate scientific ability being hardly conceivable in the absence of sufficient general intelligence.

Within the field of industry and commerce, the industrial psychologist always insists that those of the new entrants who have the innate aptitudes requisite for them to rise later to the higher positions in their firm should be recognised as soon as possible and should receive early suitable training to fit them ultimately to such posts. At the universities a similar separation is made: the pass man and the honours man are segregated from the first to receive different educations and to undergo different examinations. Even in the elementary schools it is becoming more and more usual for the bright, the average, and the stupid children to be grouped and instructed separately, so that the more highly intelligent are not hindered by the needs of the less intelligent and the latter are not pushed with the vain object of keeping pace with the former. And despite certain conceivable objections, the advantages of such differentiation have become generally recognised. But in medical education, as in the case of other professional curricula, whatever be their general intelligence and their special abilities, students are given the same technical instruction; even though only the ablest may take a first university medical qualification, there are nevertheless vast differences in the general and special abilities of those who obtain it.

Let us consider the medical student whose general intelligence is relatively weak in regard to abstract relations and ideas, but strong in regard to relations in the practical affairs of everyday life. His comparatively narrow interests are in the art of healing, and by virtue of his other mental abilities and of his temperamental qualities he may ultimately make an excellent doctor. But his vision is neither wide nor abstract enough to enable him advantageously to profit by the kind of professional education which is suited to the medical student of higher intelligence—the more strictly *centripetal* kind of education which begins with a number of different, more or less separate, scientific subjects and gradually becomes centralised in the science and art of medicine. In the case of such a student the applicability of the details of pure science to his medical interests needs to be more often kept before him; he demands a more *centrifugal* education. The question naturally arises, therefore, whether during their five or six years of medical education, as year by year it becomes increasingly complicated, differently gifted medical students will not one day receive correspondingly different training, according as they are innately fitted for abstract thought or for practical action, or even for the medical, surgical, scientific, general, or more special lines of work in their profession.

The Man and the Job

It is the function of the industrial psychologist not only to attempt to give vocational guidance, i.e., to choose the best job for a given man, but also to select the most suitable applicants for vacant posts, i.e., to choose the best man for a given job. The latter he achieves first by observing what are the abilities and the traits of character and temperament necessary for success in that job, and then by devising and applying

* Bradshaw lecture (abridged), delivered before the Royal College of Physicians of London, Nov. 2nd, 1933.

such methods of examination as will best determine whether or not the candidate possesses those abilities and traits. The candidate's abilities are assessed by specially devised tests, his temperamental and character qualities by a systematically conducted interview. The tests employed by the industrial psychologist are usually intended for the novice and are therefore of such a nature that they assess innate abilities, not specially acquired knowledge and skills; the interview is so planned as to consist in the separate assessment of the various traits of personality which are needed for success in the particular occupation, as well as in a final assessment based on the general impression which the candidate gives the interviewer.

But the wide field of the medical profession provides opportunity for the exercise of so many varieties of special ability and of temperament and character, that these general methods of vocational selection require modification. Nevertheless they could be readily applied to eliminate the unsuitable entrant to the medical profession on the grounds of his lack of innate general intelligence and scientific ability, thus taking the place of the present examinations which are too often tests of memory and of ability to reproduce the acquired minutiæ of general and scientific knowledge, and which allow the candidate to enter repeatedly until he has crammed sufficiently to satisfy the examiners.

PREMEDICAL STUDY

If the prime object of premedical scientific study had always been to teach the broad principles of natural science, selecting only such facts and details (apart from those needed to establish and adequately to confirm those principles) as are likely to be of practical help to the average doctor in his professional career, there would not have now arisen the general complaint against the teaching of physics, chemistry, and biology to the medical student. These subjects, however, are taught not by persons who have any medical training or interest, but by professed chemists, physicists, and biologists. They are not sufficiently taught, as conceivably they might be taught for the school-leaving examination, with a view to improving general culture; nor are they taught, as conceivably they might be taught for the first M.B. examination, with a view to training doctors. Too often the teaching proceeds on the assumption that there is only one way of teaching and examining in a subject—namely, in order to prepare his pupil to become a specialist in that subject—a fallacy which, until recently at least, has been recognisable throughout the medical curriculum, in physiology, anatomy, pathology, and even to some extent in the special departments of medical and surgical practice. It seems worth consideration whether the time has not come to establish a definite medical discipline throughout the training of the medical man.

A lengthy research which has just been completed at the National Institute of Industrial Psychology has demonstrated that the effects of routine practice at any given manual operation (and the same appears to hold for any given mental operation) are hardly transferable at all to other manual (or mental) operations; whereas the effects of a systematic training in the general principles underlying the performance of any one operation are very distinctly transferable so as to improve the performance of other more or less similar operations. Such experimental results bid us no longer assume that the routine exercise of memory in learning masses of formulæ or other details, or the routine practice in acquiring various skills through hours of titrating, staining, dissecting, or other laboratory work, provides a useful practice-ground for the subsequent learning of other material or for acquiring skills of other kinds. Routine practice increases the speed and accuracy of performance mainly by the elimination of needless and harmful mental or muscular processes and by the coördination of necessary processes so that they become integrated and can be performed more automatically. Although by training we cannot hope to improve any innate ability, we can improve methods of making the best use of what is inherited. What is of special value for this purpose is a knowledge of underlying general principles; and this, in the case of physics, chemistry, and biology, should be largely imparted before the age of 17, while these subjects are being taught, not as introductory to a medical future, but as a necessary subject of general education.

At the present time, a lad's general education ceases at school when, at the age of 16 or 17, he has passed his school-leaving examination. Thereupon he proceeds to specialise; and if he chooses the medical profession, he devotes his whole time to physics, chemistry, and biology, just as if he were training to become a physicist, chemist, and biologist. Surely the medical student of average ability or less need not spend so much time on masses of detail which, having little bearing on general principles, will be later forgotten; nor should his practical work be carried to such an extreme that it has no corresponding educational value for the doctor. Even if we regard such acquisitions as excellent for the man of high scientific ability and as valuable generally in providing an ideal unconscious background for the student's professional career, their enforcement implies the assumption that at 16 a lad's general culture no longer needs encouragement; it implies that henceforth he may forget and make no progress in what little he has learnt of literature, history, and languages, and that he may devote himself entirely to natural science. Almost any subject can serve to promote general culture, if only it be taught from a sufficiently wide point of view; but there are few teachers of natural science who are competent so to teach.

If the countless hours now spent in practical work in physics, chemistry, and biology served a commensurate psychological and educational purpose in the case of the average medical student, less objection could be urged against them. The value of such work could be enormously enhanced if it were more carefully directed towards training and exercising what is so essential for the successful diagnostician—the ability to select and to draw deductions from the available evidence. Such training, however, has been neglected, not because its importance has been underestimated, but because it is so much more difficult to examine the candidate in these abilities than to examine him in and to mark memorised facts.

Two other important objects of practical work are: (1) to improve the student's memory and realisation of facts by getting him to reveal them by his own handiwork instead of by merely hearing and reading about them in other people's words, diagrams, and pictures; and (2) to impress on the student the principle of not relying on the statements of others, but of verifying them by experiment and experience. But many would agree that these objects could be attained with less expenditure of time. Yet another object is often advanced in favour of practical work: that it is heuristic in character and therefore that it encourages the spirit of discovery. But in fact it seldom does anything of the kind. For the student is always forewarned in his practical work what he is to expect; and if he fails to find it, he seldom learns why he has

found something different. All that he realises is that he has done the experiment wrongly, and he repeats it until he gets the text-book result. In other words, his practical work consists merely in confirming what is already known to him; in his subsequent anatomical dissections his aim has even been to "make it look like 'Gray'"!

ANATOMY AND PHYSIOLOGY

The average medical student would not suffer if he were no longer required, as in my day at least, to recognise the form and size of each of the small bones of the wrist and hand, or to describe, as he is to-day asked, the origin, course, and relations of the thoracic duct or of the obturator nerve, the arterial supply of the spinal cord, or the course, tributaries and relations of the inferior mesenteric vein. Nor would he suffer if he were no longer expected to dissect the entire body. The divorce of the old human anatomy from physiology has resulted in the former becoming a subject of medical study which, as such, affords little scientific training. It consists too exclusively in learning innumerable facts. Embryology may throw a little of the light of science on them; comparative morphology, which might do so, hardly finds room for admission. Moreover what the medical student learns of human anatomy is derived from dissection of the cadaver, the desiccated organs of which have lost their true form and their relations in the living body. Little attempt is made at this stage of medical education to gather anatomical information from the recently alive corpse in the post-mortem room; the living subject and the teachings of radiography are also too often neglected. The movements of the viscera are hardly ever seen by the student of human anatomy, nor are the synergic actions of the skeletal muscles explained to him; structure is taught too entirely divorced from function, both normal and disordered. Even the acquirement of manual dexterity in dissection is not assured.

Teachers who cannot Teach

Other defects in medical education are largely attributable to the inadequate selection of teachers and to the increasing number of specialised subjects. From the start to the finish of his medical education, the student is taught by those whose only qualification to teach is their professional eminence. The industrial psychologist has had ample experience of the fact that the most successful and efficient worker does not necessarily make the best teacher. In industry it is mainly a matter of teaching manual technique; and not infrequently the expert proves unable to describe correctly how he carries out a skilful operation, or when he illustrates it at a slow pace he is found to employ movements quite different from those which he employs to perform it at his normal speed. Because there may be many different styles of procedure adopted—e.g., by various surgeons of equally high skill—that is no reason why the student should not be instructed in the general principles which must underlie all good methods and be taught how to avoid bad operative procedure. The industrial psychologist recognises that there is no one best way of doing anything, but that there are a number of equally good ways suited to different persons; he also recognises that there are undoubtedly bad habits of work into which the operative must not be allowed to fall. Similarly there are good and bad methods of the doctor's approach to and general handling of his patient. Yet how seldom is adequate instruction given to-day in such technique, and how rarely is the medical student examined therein.

At the universities it is notorious that the ablest professors may make the worst lecturers. Yet, alike at the universities and at the medical schools, no attempt is made to select or to train teachers, whereas to those who are preparing to teach in elementary and secondary schools systematic instruction and subsequent examination in the science and art of teaching are given. It is not surprising, then, that undergraduates complain of the inadequate teaching they too often receive, and of the number of unwanted lectures they are forced to attend. Facts, they rightly argue, may for the most part be learnt from text-books; "tips" and mnemonics (if alas! necessary) from special "grinds"; it is the coördination of facts and their application, the acquirement of technical skill, which they seek to learn through their teachers.

Moreover, from the start to the finish of his medical education, the student is taught by specialists in far too watertight compartments—by chemists, biologists, anatomists, pathologists, pharmacologists, gynæcologists, oculists, and a host of others. The average medical student will become a general practitioner, with one thousand insured persons, and often more, under his care. Yet from the start to the finish of his education he never comes in touch with one of his own future kind. Even in the general wards of a general hospital he is taught by consultants who are usually specialists in some branch of medicine or surgery, or at all events cannot pretend to as full a knowledge of the whole of either of these subjects as is expected from the student at his final examination.

Physiology, pathology, and the like can be taught by their specialists, as pure sciences should rightly be taught, in total disregard of their applied value—their practical applications to medicine and surgery. Knowledge of and research in pure science are very properly prosecuted for their own sake, not for their possible usefulness. The life-history of bacteria or the histology of tumours may be studied by one who has never seen their manifestations or appearance in the sick person. But what can the terms anthrax or carcinoma mean to the student if he is introduced to them when he has never seen a case? Undue stress tends to be laid on problems which have been subject to current or recent research, with neglect of more commonplace and practically important knowledge. The physiologist, for example, has carried out relatively little research on the rate of progress of food through the alimentary canal, on diet, or on the physiology of growth, childhood, youth, and old age. He may remember little, and does not prepare the student for what he will later learn, of physiological knowledge derived from clinical observation. The capture of histology from anatomy is but an index of his dominant interest in minute physiology—of the cell and of isolated tissues and organs—rather than in the intact organism.

How many of the details in these various sciences with which the medical student is now overburdened will he remember unless they can be and are associated with their applications? Some details are of course essential for the grasp of general principles. But many of them are only necessary for the equipment of the professed chemist, physiologist, or pharmacologist. How much more interesting, especially to the student of limited outlook, and how much more readily learnt by him would those details and principles be which are demonstrably of practical value for future practice if their applicability could be explained to him at the time, instead of treating them as the property of a pure science. Until recently our British practice has been to keep the medical student, as if in a monastery, remote from the world

of medical experience, while he bathes in the pure sciences. Surely the right course lies midway between this and the French practice of making the student spend half his time in the wards as soon as he begins to study anatomy and physiology.

Biological Differentiation or Mechanical Analysis

In educational specialisation it is important to realise the profound difference between biological differentiation and mechanical analysis. Even the unicellular organism digests, excretes, secretes, respires, and propagates. Although it has no nervous system, it is irritable and sensitive to changes in environment; it moves, and in virtue of its vitality and especially of its mobility, it must be credited with some rudimentary consciousness, however different from our own. In the multicellular organism specialised tissues, organs, and systems make their appearance, each consisting of cells which are differentiated to undertake predominantly one or other of these different functions—one tissue, organ, or system specialising in digestion, another in excretion, a third in respiration, a fourth in coördination and direction, and so on. But this differentiation is never complete. Each individual cell still carries out virtually all of the functions of the unicellular organism, in addition to specialising in its own particular function; each cell takes up oxygen and nourishment, it still excretes, it is still able to propagate.

Is that not the ideal method of specialisation at which we should aim in medical education? Psychological experiments have shown that it is generally easier to learn a whole as a whole than by learning separately its constituent parts. Therefore, should not the future clinician in his hospital period receive first a more complete education in the whole range of medicine and surgery before he visits the specialist departments to learn about the rarer diseases? At present the commoner manifestations of these specialties are not seen in the general wards and the general out-patient departments; unlike the individual cells of the multicellular organism, the general consultant physician and surgeon has lost touch with them. And the specialist cannot help being more interested in the rarer diseases of his specialty which are relatively of less importance to the future practitioner who would prefer instead a fuller training, say, in passing a Eustachian catheter, in incising the tympanic membrane, in washing out an antrum, in injecting varicose veins and piles, and in becoming familiar with remedial exercises and with the rudiments of orthopædic cobbling.

Instead of following the path of biological differentiation, medical education has evolved rather along the lines of mechanical analysis; as if a chemical compound had been split into its constituent radicles and instruction confined to these isolated factors, regardless of the fact that the whole is far more than the sum of its parts. Biologically and psychologically, first comes the vague undifferentiated whole—the unicellular organism—and later appear the discrete parts. Logically, but unpsychologically, the parts are first learnt without reference to the whole; and somehow, without adequate system, those parts are expected to be synthesised by the learner. Thus is perpetuated the fallacy of treating each patient not as a living unitary individual, but as a case of a certain single disease, and the tendency persists to divide diagnostic and therapeutic methods into those belonging to the clinician and those belonging to the laboratory scientist, into those belonging to the physician and those belonging to the surgeon.

For the origin of this attitude the history of medicine is largely responsible. In bygone times surgery was not regarded by the physician as his proper province, and has therefore developed on independent lines. The psychological effects of this isolation are not yet eradicated. They are only too readily imitated from their chiefs by young house physicians and house surgeons, the former regarding the latter much as a philosopher might regard a manual labourer, the latter regarding the less direct procedures of the physician as mysterious and unprecise gropings in the dark.

Clinician and Scientist

Not less is the mutual contempt and distrust of the clinician and the scientist. Medicine began as an art, based on few systematic principles and on scant scientific information. Its technique has grown to such proportions, medical knowledge has so vastly increased, that in some quarters medicine tends to be regarded far too strictly as a science. As an art, it demanded, like other arts, the exercise of intuition—the arrival at decisions concerning diagnosis and treatment, not always through reason and intelligence, but through the flashes of insight due to the unconscious workings of the mind, determined in direction and value no doubt by previous experience. In former days too medicine was forced to lay greater stress than now on drugs, diet, external environment, on the vis medicatrix naturæ, on the constitution or diathesis of the patient and his family, and on the personal influence of the physician. The medical student acquired his training by apprenticeship to a private practitioner. But now in virtually all occupations the place of apprenticeship has been taken by technical education. Within the memory of many of us a period has passed away when injuries to joints and bones and visceral diseases and disturbances were ascertained largely by the doctor's own ear and hand, and when it was usual for the student himself to carry out blood counts, the examination of urine, &c., of any of his patients within the hospital wards. Since then elaborate new methods of examination have been devised, the patient's fluids being removed to the pathological building for report or referred to a special department for an X ray photograph or an electrocardiogram. Of the practice of all these less subjective, more scientific, methods of procedure, the student learns something by his visits to these departments and especially through the university clinic teams which have been established in a few teaching hospitals.

But inevitably the hospital consultant's knowledge of these methods and his faith in them are less profound than the scientist's. He knows that diagnosis and especially treatment cannot depend always and wholly on the aids which laboratory methods can render. He realises that the teachings of physiology and pathology in their experimental work on various living fractions of an entire organism are not always applicable to the entire organism; that, as an individual, the patient cannot be considered a mere appendage to the bacterial invasion or other cause responsible for a disease or a growth. He is convinced that the experience and insight of the clinician must stand guard over the applications of research.

And just as the ablest clinicians recognise not only the limitations of research, but also the inestimable value of the new instruments of technique with which medical research has provided them, so there are research workers fully aware that pure research must always be the servant, not the master, of the physician or surgeon. They admit that in the treatment of the

sick other considerations must be taken into account besides conclusions drawn from experiment and based on a purely physical standpoint. Nevertheless, they fear, not without foundation, that the excessively empirical attitude of many hospital consultants tends to extinguish the research spirit of students. They lament that, both for this reason and because physiology—or more particularly biochemistry and biophysics—seduces some of the most promising research workers from completing their medical education, recruits are now lost to medical research of a more strictly clinical kind. They would therefore have the medical student, before he comes in touch with patients, better prepared for the wide gap he will discover between the simplicity of experimental science and the complexities of practice.

Unpreparedness for Practice

The average medical student realises too late that in practice he cannot depend for diagnosis and treatment on the elaborate methods he has seen employed during his hospital education. Small wonder that he comes to wish he had not spent so much time in learning technique, in attending grinds, and in being spoon-fed for examinations where he may be questioned on the characters of the organism responsible for bubonic plague or the microscopic structure of teratomata of the testicle. Small wonder that he comes to wish he had spent more time in the wards, and less time in seeing the rarer operations in the theatre; that he had learnt more about prescribing drugs and diets, and gained more personal experience in bandaging, passing a catheter, and other manual dexterities, particularly in such common or emergency operations as empyema drainage, blood transfusion, and those needed for amputations, appendicitis, or strangulated gut. He will regret he had been encouraged to give so much attention to the methods of diagnosis of rare conditions and so little to treatment, particularly in the early stages, of such common diseases as colds, sore-throats, rheumatic and gouty affections, and disorders of digestion, and in the late stages of incurable diseases of which he saw so little in hospital.

The general practitioner realises too late how unprepared he is for the conditions he will meet in practice; how often he is forced to rely on intuition as to whether or not a patient deserves systematic examination for the diagnosis of his state; how little he has learnt of the palliative, as distinct from the curative, functions of the physician and surgeon; how ill-equipped he is to give advice on general health and hygiene, particularly in the case of children, and expectant or actual mothers, and on prognosis in relation to insurance companies; how little he has been taught of preventive medicine and of the public health services that are now required of him; how ignorant he is of the best attitudes and approaches of the practitioner towards his patient, of the motives and other determinants of human behaviour, and of the anxieties and the marital difficulties of his patients which are so often a fundamental cause of their bodily ill-health.

Fundamentally, it seems to me, the whole problem arises from the conflict between the ideals, needs, and interests of the general practitioner, on the one hand, and those of the medical scientist and the consultant on the other, who are his sole teachers during his years of clinical study. If a common curriculum must at present be maintained for the education of all three, can there be any doubt that just as an appropriate training is provided immediately after qualification for the future medical research worker and for the future consultant physician and surgeon, so immediately after qualification an appropriate further training given by experienced general practitioners should be provided for and required of the future general practitioner before he receives his diploma or degree? It is hardly necessary to point out how different is the life-work of the consultant and the general practitioner and the relation between them and their patients.

A Mechanistic Outlook

The difference in outlook of the medical scientist and the medical practitioner deserves some further consideration. The physiologist and the pathologist tend to regard the human being as a collocation of physical mechanisms. They restrict the term science to the mathematics, physics, and chemistry of matter. If living matter consists in more than these, then that "more," they argue, lies beyond the domain of science; anything in life resembling the direction and purpose which we all recognise in our own minds is foreign to natural and to medical science. And so the medical student learns, from start almost to finish, to regard the living organism merely as an aggregate of machinery. While he is taught in the utmost detail the functions of the normal human body, he learns virtually nothing of the functions of the normal human mind. All that he is taught of this in his physiology is a mere smattering of facts about touch, taste, hearing, and vision, mainly in so far as they can be brought into some more or less hypothetical relation with material structures in the skin, tongue, cochlea, or retina; and a mere smattering of facts about visual, auditory, and verbal perception and imagery, partly because, on quite erroneous grounds, it has been supposed that the "seats of consciousness" for percepts and images have been experimentally localised in definite areas of the cerebral cortex.

He learns nothing in his physiology of the relations between mental and bodily activity; he is taught nothing about the emotions, despite their intimate connexion with endocrine and visceral activity. He learns nothing about intelligence, although later he will have to consider it in relation to mental and endocrine deficiency. He learns nothing of the psychology of suggestion, despite its frequent use by him in everyday practice. Of memory, impulse, and volition, of the differences between the mind of the child, the adolescent, and the adult, he also learns nothing. All that is required by the General Medical Council, in a regulation now exactly forty years old, is that before qualification the medical student shall have attended at least four-fifths of a course of 12 lectures on mental diseases and 12 clinical demonstrations at some recognised institute for the insane. Of the mechanism, of the results, and of the treatment, of the common quasi-normal mental disturbances and of the uncertifiable disorders of the mind, he learns virtually nothing.

Is this an adequate preparation for appreciation of the important part which the mind is now almost universally recognised to play in bodily disorders? Does it not tend to perpetuate the hardly bygone times, when a psychoneurotic patient might be sent from department to department of a general hospital to be treated according to the temporary manifestation of his unrecognised psychoneurosis; or when in private practice such a patient might be successively submitted to a series of operations? Does it prepare the practitioner to recognise the psychoneurotic element responsible for some of the commonest disorders of digestion, respiration, menstruation, and circulation? Does it give him any knowledge of the

nature and phenomena of mental conflict and repression, of mental maldevelopment, fixation and regression, so that he knows how to treat mental depression, drug addiction, sexual aberrations and malpractices in adults, truancy, stealing, stammering and enuresis in the young? Does it prepare him for the increasingly recognised fact that the general practitioner can do much to prevent not only ill-health but also juvenile delinquency?

Put Psychotherapy on a Firm Basis

Is psychotherapy, with the psychological training preparatory for it, to be excluded from medical education because of the wild claims and generalisations of certain schools whose rival extravagances, nevertheless, are based on discoveries of undoubted truth and importance? Just as it has been said that biochemistry and biophysics—which originated not from chemistry and physics but from physiology—urgently need recruits from among pure chemists and pure physicists, so it is important that modern psychotherapy—which arose not from psychology but from medicine—should obtain recruits from those who have received the systematic training of experimental psychology, in order to place this latest specialty on a firmer scientific basis. Even if a long period of expert treatment by specialists is requisite in certain cases, especially in neglected cases, there are numerous others which can be successfully treated by the general practitioner if only he had been trained to recognise and treat the prevalence and presence of psychoneuroses. Surely the teaching of psychology, psychopathology, and psychotherapy is not to be excluded from normal medical education because hitherto the physiology and pathology of the body and pharmacology have appeared to be so much more important that it has been impossible to find time for the study of mental processes; or because the study of the mind can never be recognised as a science until suggestion, memory, will, hysteria, hypochondria, anxieties, and fears have been allocated to a material basis? "Imaginary diseases," I recall my chief once saying to me during my house physicianship, "require imaginary remedies." This was the view largely prevalent thirty or forty years ago, when it was the practice to treat medicinally or surgically every disorder which could be attributed to localisable and visible disturbance in a bodily organ or system, and to consider psychotherapy only when the disorder was of an inexplicable, "functional," nature. The fallacy underlying such a view is, I fear, by no means extinct to-day.

It may be urged that my psychological training leads me to exaggerate the importance of this subject. But the medical psychologist has clearly demonstrated the importance and prevalence of emotional and psychoneurotic disorders in the factory and the office, not only as causes of industrial unrest, but as responsible for much of the long or repeated absenteeism ascribed to gastritis, rheumatism, heart attacks, or dysmenorrhœa. Moreover, since psychology, psychopathology, and modern psychotherapy have had hitherto no place whatever in the official general medical curriculum, any distortion of their claims on my part (which I do not for one moment admit) becomes of little importance. Similar objections must indeed confront every advocate of progress in medical education. For medical education is, as we have seen, almost wholly in the possession of specialists, each with his own vested interests, each maintaining the supreme importance of a full knowledge of his subject for the medical student, and strenuously opposing any reduction in the time devoted to it.

Apprenticeship

Progress can only be made if a conscientious effort is made in common to determine and to agree upon the objects of medical education. The school teacher during his training learns not only what, but also how, he is to teach. The clergyman during his training learns not only what, but also how, he is to preach. Both teacher and clergyman are instructed in the practical difficulties with which they will meet in their future educational and parochial work, and how these difficulties may best be overcome. Such training will not make a teacher or a clergyman efficient, if he be naturally unfitted for his work. But it will unquestionably serve him as a short-cut to success, saving him unnecessary trials and errors in the otherwise needlessly dear purchase of experience.

In the professional part of medical education and examinations, can we rest satisfied with the current proportions of stress laid on knowledge of general principles, facts, and implements, on the one hand, and on skill and wisdom in their use in actual practice, on the other? If surgery cannot be properly learnt from actual operations until the student has passed a qualifying examination, such learning should surely not be deferred until the newly fledged general practitioner is earning his living in private practice. If the surgical specialist acquires his experience by years of hospital surgery and attendance on his surgical chief after he has attained his first medical degree, surely the general practitioner should be similarly compelled—for a briefer period—to do likewise. Could there not be a kind of apprenticeship period for the general practitioner between the passing of the present examinations for a first medical qualification and the actual conferment of the first medical diploma or degree? Such apprenticeship would be needless for the future specialist and research worker, who would continue, as at present, to work for a higher medical, surgical, or scientific degree. The increased duration of education will be urged against a period of apprenticeship. But if the time at present devoted to physics, chemistry, and biology after the school-leaving examination could be reduced; if the years devoted to anatomy, physiology, and pathology could be shortened, or even if these latter subjects could in part be learnt at first broadly as part of biology and later in more special relation to surgical and medical needs; if the work of the special hospital departments could be learnt rather in a general than in a special way—probably no extension of the present period of general medical education would be needed. Indeed room could be found for the inclusion of instruction in the elements of normal psychology, psychopathology, and psychotherapy.

Other Conclusions

Differentiation in teaching and examination between students of moderate and brilliant intelligence, at all events in regard to preclinical studies, appears on psychological grounds likewise much to be desired. For the pass-man a knowledge of fewer facts of professional unimportance should be expected, even if he enter for one of the present diploma examinations. A more definite medical discipline or universe must be evolved. The medical student's teachers need to be more stringently selected on the basis of their ability to teach. And finally, effort should be made to bring his medical, surgical, laboratory, and clinical research teachers—and the subjects which they teach—into closer relation with one another.

These, to a medically qualified psychologist, appear to be the most urgent needs for reform in current medical education.

THE USE OF 3:5-DIIODOTHYRONINE IN THE TREATMENT OF MYXŒDEMA

BY A. B. ANDERSON, PH.D. CAMB., M.R.C.S. ENG.*
ATTACHED TO THE MEDICAL UNIT, UNIVERSITY COLLEGE HOSPITAL, LONDON

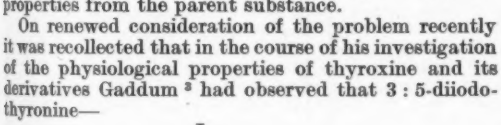
C. R. HARINGTON, M.A. CAMB., PH.D. EDIN., F.R.S.
PROFESSOR OF PATHOLOGICAL CHEMISTRY IN THE UNIVERSITY OF LONDON, AT UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL; AND

D. MURRAY LYON, M.D., D.SC., F.R.C.P. EDIN.
PHYSICIAN TO THE ROYAL INFIRMARY, EDINBURGH, AND PROFESSOR OF THERAPEUTICS AND CLINICAL MEDICINE IN THE UNIVERSITY OF EDINBURGH

IT is well known that thyroxine is of little therapeutic value as compared with dried thyroid gland, since the former substance only exhibits its full effect when administered by injection. The fact that thyroid gland is physiologically active when given by mouth shows that the failure of thyroxine to act after oral administration is not due to the destructive action of the alimentary enzymes. It is rather to be supposed that the extreme insolubility of pure thyroxine in the free condition prevents its absorption from the gut. This view is supported by the fact that a relatively simple peptide containing thyroxine which can be derived by the enzymic degradation of thyreoglobulin [1] is fully as active when given by mouth as an amount of thyroid gland containing the same quantity of iodine.

If therefore a means could be devised of rendering thyroxine water-soluble a product might be obtained which would be of therapeutic value. Some attempts were made a few years ago [2] to achieve this end by the synthesis of certain peptides and other derivatives of thyroxine which it was hoped might satisfy the required conditions. These attempts failed, largely because of the technical difficulties which made it impracticable to introduce more than the simplest amino-acid or other residues into the thyroxine molecule; the simple derivatives of thyroxine which were obtained did not differ markedly in physical properties from the parent substance.

On renewed consideration of the problem recently it was recollected that in the course of his investigation of the physiological properties of thyroxine and its derivatives Gaddum [3] had observed that 3:5-diiodothyronine—



exhibited a significant degree of thyroid-like activity. When tested by the acceleration of metamorphosis of tadpoles, the ratio of the activities of thyroxine and 3:5-diiodothyronine was approximately 15:1, and when tested by the effect on the oxygen consumption of rats the ratio was about 40:1. In the latter experiments both substances were administered by subcutaneous injection.

The solubility in water of 3:5-diiodothyronine in the free condition, although low, is considerably greater than that of thyroxine, and this difference between the two compounds is still more marked in the case of their salts both with acids and alkalis. It seemed likely therefore that 3:5-diiodothyronine would be correspondingly more readily absorbed than thyroxine, in which case it might constitute a valuable therapeutic substitute for thyroxine or thyroid gland.

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The Clinical Investigation

The object of the present note is to provide experimental evidence that 3:5-diiodothyronine can in fact be used successfully for the relief of the symptoms of myxœdema in man; moreover, it exhibits its action with a high degree of regularity when given by mouth.

Six cases have been studied, the investigation being carried out on the following lines.

Before treatment all drugs were withdrawn and the patients allowed to rest in bed until the basal metabolic rate had reached a steady level. The metabolism was determined by the Douglas bag method, using the Haldane apparatus for gas analysis. The drug was administered daily by mouth in solution as the disodium salt made up in the following manner: 500 mg. of 3:5-diiodothyronine were dissolved in 19·0 c.cm. of N/10 sodium hydroxide with the addition of a little water, the mixture being heated until dissolution was complete. The solution was then diluted with distilled water so as to contain 50 mg. of diiodothyronine in ℥ i. This solution was given by mouth after food. The standard dose was 50 mg. daily. This dose was well tolerated, and with continued administration over periods of two to three weeks no toxic effects were observed. A larger dose of 75 mg. given in one case was equally devoid of toxic effect. In one case the drug was given in pill form with less satisfactory results (see notes, Case 4).

CASE RECORDS

CASE 1.—Female, aged 67. In 1907 she was attending St. Bartholomew's Hospital as an out-patient. The clinical picture was that of myxœdema; a cold dry skin, slow speech, baggy eyes, and dry mouth. The heart was enlarged. She was treated with thyroid gland as an out-patient. In 1910 glycosuria occurred temporarily, but ceased on discontinuing the thyroid for two weeks. In 1928 she was treated medically for gastric ulcer. There was a noticeable change in her condition when any attempt was made to reduce the amount of thyroid she was taking.

On April 28th, 1933, she was admitted to University College Hospital, thyroid treatment having been discontinued three weeks previously. Clinically there were no very obvious signs of myxœdema, but the basal metabolic rate (B.M.R.) was found to vary between −20 and −22 per cent. From May 16th to 24th she was given 50 mg. of diiodothyronine daily, at the end of which time the B.M.R. had risen from −22 to +2 per cent., and there was a slight rise in the resting pulse-rate from 55 to 67 (Fig. 1). There was no appreciable fall in weight in this case. The drug was discontinued and in six days' time the B.M.R. had fallen to −15 per cent. and the pulse to 55. The patient, who had been feeling better during treatment, now complained of feeling worse, and was dull and depressed. She was unaware that the drug had been withdrawn, since flavoured water was substituted. On May 29th she was put back on 50 mg. diiodothyronine daily, and in 12 days the B.M.R. had risen to +8 per cent. (Fig. 1) and the resting pulse-rate to 64. Her general condition was much improved. This patient showed no change in weight during treatment; her initial weight, however, was low (55·5 kg.).

CASE 2.—Female, aged 45, also attending St. Bartholomew's Hospital as an out-patient. A diagnosis of myxœdema was made in 1921, and treatment started with thyroid grs. 4 t.d.s., and continued with smaller doses. Her original complaint of menorrhagia was treated by X ray irradiation of the pelvic organs. From time to time during treatment she suffered from headaches and giddiness and falling hair. For months at a time she was quite well, but her condition appeared to fluctuate very much in spite of treatment. On August 11th, 1933, she was admitted to University College Hospital, treatment with

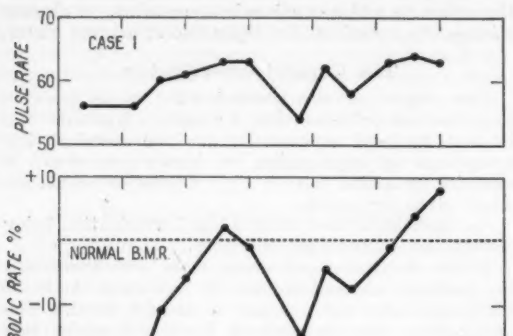

FIG. 1 (Case 1).—Chart showing changes in pulse-rate and basal metabolic rate under treatment with 3:5-diiodothyronine. The periods of administration (50 mg. daily) are indicated by the black areas on the base line.

thyroid having been discontinued four weeks previously. She had gained 1 st. in weight since the thyroid was discontinued, and her B.M.R. varied between −23 and −24 per cent. From August 20th to Sept. 1st she was given 50 mg. diiodothyronine daily. Nine days after starting treatment the B.M.R. had risen from −23 to −9 per cent. (Fig. 2), and the resting pulse-rate had increased from 62 to 75. By the end of this period her weight had fallen over 2 kg. She was then sent home for a week on a daily dose of 50 mg. of the drug, and at the end of the week re-admitted when her B.M.R. was found to be −9 per cent. (Fig. 2) and her pulse 62.

CASE 3.—Male, aged 61. Was in normal health until ten years ago when he began to complain of lassitude, weakness of his legs and arms, and pains in his limbs. During the last five years his face and eyelids had been swollen.

Clinically the skin was dry and scaly, more especially on the extensor aspects of the limbs; the eyelids were swollen, the eyebrows and hair scanty, and the skin of the face thickened. His voice was gruff and speech slow. Impairment of memory was not marked. His weight was 89 kg. The systolic blood pressure was 160 mm. Hg, the urine contained a trace of albumin, and the urea-concentration test indicated a slight impairment of renal function. Blood-urea was 30 mg. per 100 c.cm. There was no œdema of the legs. The B.M.R. varied between −26 and −29 per cent. On the basis of these findings, a diagnosis of myxœdema with mild chronic nephritis was made.

From August 26th to Sept. 4th, 1933, he was given 50 mg. diiodothyronine daily. This was followed by an immediate rise in metabolism, and after nine days the B.M.R. had risen from −26 to −10 per cent. (Fig. 2), the pulse from 60 to 68, and there was a loss of weight of 4·5 kg. The dose was then increased to 75 mg. daily, and after a further seven days the B.M.R. had risen to −5 per cent., and there was a further fall in weight of 3 kg. This large fall in weight which pursued a steady course and amounted to 7·5 kg. in 16 days was an especial feature of this case. No toxic symptoms were observed.

CASE 4.—Female, aged 65. She was originally admitted to University College Hospital in 1922 as a severe case of Graves's disease with fibrillation. Her condition did not respond to medical treatment, so ligation of the superior thyroid arteries was performed, and four months later a right hemithyroidectomy was done. After a slow recovery the condition remained improved until 1924, when the symptoms returned and the left lobe of the thyroid was found to be enlarged. In 1925 the symptoms had increased in severity and the isthmus and lower left pole of the thyroid were removed at operation. Her condition again improved and remained fair for five years. For the last two years the sight had been failing with the development of bilateral cataract and the general condition had been poor, with loss of taste and appetite, weakness, and undue sensitivity to cold.

Clinically the skin was dry and cold, that of the face being thickened and yellow in colour, thickened eyelids were associated with a residual bilateral exophthalmos. Her speech was slow and grating in tone. She was poorly nourished and underweight. The heart was fibrillating with a pulse-rate in the neighbourhood of 90. Radiography of the chest showed an enlarged heart. The B.M.R. varied between −30 and −32 per cent. On the history and these findings a diagnosis of post-operative myxœdema was made.

From Oct. 3rd, 1933, she was given 50 mg. of diiodothyronine daily and by the 11th the basal metabolism had

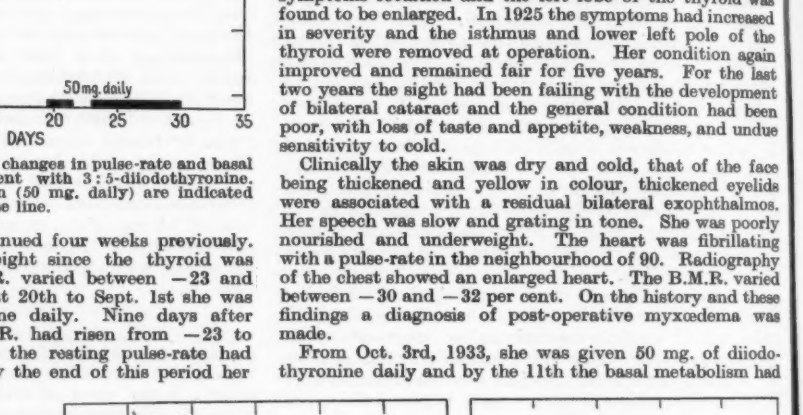

FIG. 2 (Cases 2, 3, 4, and 6).—Basal metabolic rate of patients under treatment with 3:5-diiodothyronine in doses of 50 and 75 mg. daily. The cross-hatched areas indicate treatment at home in Case 2 and with tablets in Case 4.

risen from −30 to −11 per cent. (Fig. 2) with a fall in weight of 2·5 kg. The pulse-rate taken two-hourly in the ward increased at first, fluctuating at times between 90 and 120, but later settled to 80 to 100, which was the rate before starting treatment. Her condition was much improved; the sense of taste returned and her appetite increased and she was much brighter. On Oct. 12th she was put on digitalis and the method of administration of the diiodothyronine was changed. It was now given in pill form made up with a lactose base; one pill containing 25 mg. diiodothyronine was given twice a day after food.

As will be seen from the chart (Fig. 2) the drug given in the solid form failed to maintain its full effect; since the general condition of the patient was unsatisfactory, however, the failure may have been due to other causes. More work is necessary before it can be concluded that the administration of the drug in the form of a solution is essential.

CASE 5.—Female, aged 67. Enjoyed normal health until 1916, when she was noticed to be becoming dull mentally and disinclined for effort. She was definitely diagnosed as a case of myxœdema in 1920, and during the next few years took thyroid at very irregular intervals. In January, 1926, she was admitted to the Royal Infirmary, Edinburgh, on account of lack of energy and obesity. The clinical picture was typically that of an advanced myxœdema with a B.M.R. of −46 per cent., a harsh dry skin, slow pulse, supraclavicular pads of fat, and an increased sugar tolerance. The only feature not absolutely typical was the hair, which has never been characteristically dry and scanty. Ever since this time she has been in and out of hospital, as she has not been sufficiently intelligent to regulate her dose of thyroid efficiently, and also complained that it gave her palpitation. On each readmission the B.M.R. had fallen to between −33 and −45 per cent. On two occasions she has been given large intravenous doses of thyroxine, which raised the B.M.R. rapidly over the normal level, but were accompanied by somewhat severe symptoms of diarrhœa, palpitation, headache, and nausea. Approximately grs. 6 of thyroid a day were found necessary to maintain her B.M.R. at a normal level. This dosage she professed herself unable to take without distressing symptoms of palpitation.

Her last admission was on April 26th, 1933, when she was found to be in her usual myxœdematous condition, with a B.M.R. varying between −35 and −40 per cent. From May 2nd she was given each day 50 mg. of 3:5-diiodothyronine orally. Six days after starting this treatment her B.M.R. had risen from −37 to −9 per cent. (Fig. 3), and her weight had fallen considerably. This increase of metabolism was accompanied by none of the unpleasant symptoms previously experienced with thyroxine, and to a less extent with small doses of ordinary thyroid extract. Although a similar dose of diiodothyronine was persisted with for a fortnight longer the patient's B.M.R. never showed any tendency to rise unduly, remaining just on the lower side of normality. Her weight, however, continued to fall satisfactorily, and her mentality was much brighter. The pulse-rate rose slightly from an average of 68 to one of 78. A fortnight after the drug was discontinued the B.M.R. had again fallen to −38 per cent., the weight, in spite of the diet being kept constant as regards caloric intake, was rising steadily, and her general myxœdematous symptoms, which had been apparently alleviated by the drug, had reappeared.

CASE 6.—Female, aged 43. Had enjoyed normal health until three or four years before admission, when she was noticed to be putting on weight and to be becoming tired, lethargic, and dull mentally. On examination at the Royal Infirmary of Edinburgh six months before the present admission she was found to be suffering from typical myxœdema. She was much overweight, with large supraclavicular pads of fat, a dry, yellowish coarse skin, slow cerebration and slow speech, a slow pulse, and a B.M.R. in the neighbourhood of −30 per cent. It was found necessary to administer grs. 4–5 thyroid a day to maintain her B.M.R. at a normal level.

Previous to readmission, on June 23rd, 1933, she had been taking thyroid, and some days were allowed to elapse for the effect of this to wear off. A daily oral dose of 50 mg. of diiodothyronine was begun on July 3rd. For some days before this her B.M.R. had been varying from −24 to −27 per cent. Eight days after beginning the medication her B.M.R. was normal; the diiodothyronine was stopped on July 12th, when the B.M.R. returned to its initial low reading of −27 per cent. in the space of seven days (Fig. 2). Coincidentally with the increase of metabolic rate some fall in weight occurred, and the pulse-rate was increased from an average of 65 to an average of 79. The weight began to increase and the pulse-rate to fall within four days of the drug being discontinued.

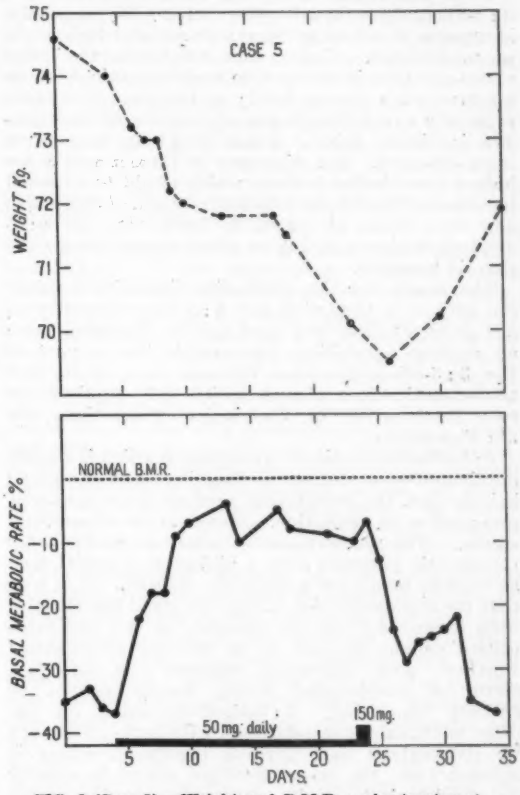

FIG. 3 (Case 5).—Weight and B.M.R. under treatment.

During the whole time that the patient was receiving the drug she complained of no unpleasant symptoms, and indeed felt considerably better and was much brighter.

ELECTROCARDIOGRAPHIC OBSERVATIONS

Abnormalities in the electrocardiogram which disappear on treatment with thyroid are very common in myxœdema. They were present in 12 out of 19 cases examined by Willius and Haines.[4] White[5] states that absence or inversion of the T wave in all leads is pathognomonic of the disease and believes that alterations in the curves are valuable in indicating the progress of thyroid therapy. We are indebted to Dr. E. J. Wayne for the following note on two of our cases.

Two of the cases studied in the present investigation have had electrocardiograms taken before and after treatment with diiodothyronine. In one of these (Case 3) the T wave in all three leads was isoelectric before treatment (B.M.R. −27 per cent.). After 16 days' treatment with the drug, definite positive T waves were present in leads I and II and a negative T wave in lead III (B.M.R. −5 per cent.).

In the second case (Case 2) isoelectric T waves

were also present in all leads before treatment (B.M.R. −25 per cent.); after 13 days' treatment (B.M.R. −9 per cent.) the curves showed clear positive T waves in leads I and II. In lead III the T wave remained isoelectric.

Discussion

It is clear from the results described above that 3 : 5-diiodothyronine, in doses of 50–75 mg. daily, is capable of relieving the symptoms of a high grade of myxœdema. Under such treatment the basal metabolic rate is restored to and maintained at an approximately normal level; at the same time there is usually a considerable loss of weight and the pulse-rate is slightly raised. Toxic symptoms have never been observed. The diagrams in Figs. 1 and 3 are indeed very similar to those which would be obtained in response to the daily injection of 1 mg. of thyroxine, and there seems no reason to doubt that the 3 : 5-diiodothyronine is acting as a true substitute for the thyroid hormone.

The reason for the qualitative similarity between the actions of thyroxine and 3 : 5-diiodothyronine is not perfectly clear and need not be discussed here; an obvious possibility, however, is that a part of the 3 : 5-diiodothyronine becomes converted into thyroxine itself, a change which only requires the easy introduction of the iodine atoms into the 3′ : 5′-positions.

3 : 5-diiodothyronine is a compound which is readily obtainable by a synthetic method in a state of purity; it is, in fact, the penultimate product in the synthetic preparation of thyroxine. Moreover, it is perfectly stable. The advantages of such a product for therapeutic purposes over a biological material such as thyroid gland are sufficiently evident. It is true that the standardisation of thyroid gland has recently been improved,[6] but the accuracy of this standardisation cannot be said to be securely established.[7] Further, with biological material the uncertain factor of deterioration during storage cannot be entirely eliminated. 3 : 5-diiodothyronine, on the other hand, can be standardised with perfect accuracy by its analysis and physical constants, whilst it appears from the cases described above to exhibit its physiological activity with a remarkable degree of constancy.

It is hoped, therefore, if further experience should substantiate the results recorded above, that 3 : 5-diiodothyronine may prove to be a valuable substitute for thyroid gland in all cases where administration of the latter is indicated.

In conclusion, we wish to express our thanks to Dr. R. Hilton, of St. Bartholomew's Hospital, whose coöperation made possible the investigation of two of the cases described.

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A NORTHERN EYE HOSPITAL.—A new wing of the Newcastle, Northumberland, and Durham Eye Hospital at Newcastle-upon-Tyne was opened recently by the Duchess of Northumberland.

PRIMARY MENINGITIS DUE TO THE GÄRTNER BACILLUS

BY F. HARWOOD STEVENSON, M.D., M.R.C.P. LOND.
CHIEF CLINICAL ASSISTANT AND REGISTRAR FOR DISEASES OF CHILDREN, GUY'S HOSPITAL; AND

LANCELOT K. WILLS, M.B. CAMB., M.R.C.S. ENG.
ASSISTANT BACTERIOLOGIST AT THE HOSPITAL

THE *B. enteritidis* Gärtner, belonging to the salmonella group of organisms, is one of the causes of acute gastro-enteritis. It has been reported that this bacillus may also be associated with disease in other organs of the human body. Gregg and Hayes [7] recovered the organism from the urine in a case of continued fever following a gunshot wound in the chest; Rosher and Wilson [12] described a sporadic case of fever that ran a typical typhoid course, but was shown from the agglutination of the patient's serum to be due to *B. enteritidis;* Dean [4] isolated the bacillus from the gall-bladder, from one of the gall-stones, and from the fæces in a chronic case of cholelithiasis. A few authors [3 8–10] have recorded cases of infection of the meninges with *B. enteritidis*, but like cases of meningitis due to allied organisms —e.g., *B. paratyphosus* B [1 2] Morgan's No. 1 bacillus [5] —they are of sufficiently infrequent occurrence to warrant the publication of the following case, which would appear to fall into the group of primary and uncomplicated meningitis due to this organism, of which we have been able to find less than a dozen recorded.

CASE-HISTORY

Joan X. was aged 9 weeks when first seen on July 19th, 1933, and weighed 5 lb. 12 oz. She was one of twins born about a fortnight before the calculated date. Each weighed about 4¾ lb. at birth. They were stated to be jaundiced at birth, the jaundice taking about three weeks to disappear. The mother quite early developed a breast abscess, and the babies were fed with Ostermilk in quantities fully adequate in food value and fluid content. A week before she was first seen the infant was said to weigh 6½ lb.—her highest recorded weight. Her story before admission was as follows:

Nine days previously she had become irritable and, according to the mother, was constantly straining as though to pass a stool, although she only continued her normal habit of one or two yellow motions daily. She continued to take her normal feeds without vomiting until the fifth day of illness when she vomited once and began two days of diarrhœa. For these two days she had four foul-smelling brown frothy motions a day. On the seventh day she vomited again once only. On the evening of the eighth day she began to have frequent twitchings of the mouth and clonic movements of the right arm and leg. Occasionally the eyes were deviated upwards and to the right.

On admission the rectal temperature was 100·4° F., pulse 140, respiration 50. The child was toxic and markedly dehydrated. The chest, heart, abdomen (including umbilicus), throat, and drumheads were normal. There were no enlarged glands. There was an occasional divergent squint. Head flexion was resented, but there was no neck rigidity. Kernig's sign was suggestive though the spasm was by no means marked. The fontanelle was somewhat full but quite easily compressible when the child was not crying. Shortly after admission a small normal stool was passed. A 5½-oz. subcutaneous saline was immediately given. As the child would not suck, œsophageal

feeds were commenced. Later the same day a 2-oz. blood transfusion from the father was given after satisfactory cross-grouping. By evening there was considerable improvement and, although very restless, dehydration was much less marked. Another formed stool was passed. The later course was as follows:

July 20th. Child now neither dehydrated nor collapsed, but very restless and still twitching in all limbs. The fontanelle was now definitely full and bulging. On lumbar puncture 2 c.cm of purulent fluid were withdrawn under increased pressure. Examination showed many polymorphonuclear leucocytes and gram-negative extracellular bacilli, so no serum was given. Œsophageal feeds were continued 2 oz. three-hourly. The same evening much twitching but no rigidity. Lumbar puncture repeated but little obtained. Cisterna puncture was more successful and 10 c.cm. were withdrawn. It was not possible to wash through with saline from above downwards.

July 21st. Improved appearance and colour, though twitching continued. Increased bulging of the fontanelle during the day coincided with a deterioration in the general condition. The temperature had risen from 102° to 105° F., and the pulse to 170. The respiration had continued at about 70 to the minute. Lumbar puncture the same afternoon was dry, but 12 c.cm were obtained from the cisterna. The child was much worse and the abdomen distended. In view of the obvious prognosis, ventricular drainage was not attempted.

July 22nd. Increasing collapse and dehydration. Temperature was down to 99° F., pulse 180, respirations 90. Very little twitching, no rigidity, fontanelle slack.

Death occurred at 7 P.M. on the twelfth day of illness.

AUTOPSY

There was a general emaciation of the body and some cloudy swelling of the kidney and liver, together with slight fleshy enlargement of the mesenteric glands. The spleen—rather diffluent—was enlarged twice its natural size, and showed a pallid swelling of the pulp and an increase in the size of the Malpighian bodies. The intestines were macroscopically normal. The specific findings were confined to the brain and meninges.

The most striking feature in the appearance of the brain was the general œdema of the brain substance without "softening." McNee [9] has recorded a simila observation. Smith [12] has found hyperæmia of the brain superficially, and the ventricles dilated with blood stained purulent fluid. We noticed that thick yellow fibrinous pus covered the base of the brain, distending the basal cisternæ and extending along the fissures towards the vertex on each side. The convolutions were considerably flattened and the sulci partially obliterated as a result of the general rise in pressure. A basal pressure cone was evident. On section of the brain this suppurative meningitis was seen to be complicated by similar infection of the ventricles. These were greatly dilated. In no part of the brain was there any evidence of hæmorrhagic necrosis or other softening than that accompanying the œdema.

Microscopical section of the brain and meninges showed a polymorphonuclear meningitis with cortical œdema and softening. Here and there scattered in the substance of the exudate were small groups of gram-negative coliform bacilli. There was no encephalitis, nor any vascular thrombosis.

Sections of spleen, mesenteric lymph gland, and kidney were examined microscopically, but the changes in these organs, even the active mononucleosis of the spleen, were not thought to be specific in any way.

An attempt was made to trace the source of the infection. Some of the bright yellow fæces were taken for cultural examination on nutrose agar, but only "red" colonies were obtained. There was no evidence of inflammation of the intestines, nor any other abnormality to suggest an enteric infection. This agreed with the post-mortem findings in the cases recorded by Pesch,[11] by Smith,[12] and by Symmers and Wilson.[15]

BACTERIOLOGY

The cerebro-spinal fluid obtained at lumbar puncture on the day after admission was turbid, slightly yellow in colour, and showed a thick deposit at the bottom of the tube. The turbidity was mainly due to the presence of vast numbers of organisms which were easily detected in the counting chamber. The chemistry of the fluid was as follows:

Of a total of approximately 2000 cells per c.mm. 10 per cent. were red blood-cells and 90 per cent. were a mixture of polymorphonuclear leucocytes and pus cells. There was a high protein content, 0·5 per cent., or 25 times normal. The chloride content was definitely reduced to the very low figure of 505 mg. per 100 c.cm. No reducing bodies were present by Fehling's method.

No gram-negative cocci but many gram-negative bacilli of coliform type were present in direct smears. The bacillus readily grew on ordinary culture media.

The growth on agar and blood-agar slopes was entire with thin margins, greyish-white in colour, and smooth in consistence. It was abundant and reached its maximum in 48 hours. Small, smooth, discrete colonies were obtained on agar and blood-agar plates. In broth there was a heavy turbidity with a granular sediment. A luxuriant growth was obtained on a gelatin slope culture; a gelatin stab culture showed growth along the line of inoculation, and also on the surface after a few days. Cultural growth was due to a gram-negative bacillus, not unlike *B. typhosus*, with filamentous forms in broth. On nutrose agar, small "blue" colonies appeared on the surface of the plate; they remained unchanged at the end of 72 hours.

The biochemical reactions of this bacillus were investigated, and it was found that dextrose, galactose, maltose, and mannite were fermented, that faint acid but no gas production was obtained with dextrin, and that lactose, saccharose, glycerin, and inulin were unaffected. With litmus milk alkaline production was slow but no clot was formed. Gelatin was not liquefied and no indol was produced. The bacillus was actively motile. No change was noticed in these reactions at the end of 12 days. A five-hour suspension of the bacillus showed the following reactions with agglutinating sera:

Negative agglutination with *B. typhosus*, *B. paratyphosus* A, *and B. aertrycke* (Oxford); partial agglutination with 1:200 *B. paratyphosus* B; negative agglutination with dilutions higher than 1:4000 *B. paratyphosus* C (suipestifer, Oxford) and 1:8000 composite salmonella group (Oxford); positive agglutination to the limit of titre (1:3200) *B. enteritidis* Gärtner (Burroughs and Wellcome); and complete agglutination with a dilution of 1:32,000 (partial with 1:64,000) *B. enteritidis* Gärtner (Oxford).

Comparative tests with the bacillus were carried out with a stock culture of *B. enteritidis* Gärtner, with which the bacillus showed agreement in all characteristics.

EXPERIMENTAL

A rabbit inoculated intraperitoneally with 2 c.cm. of a 48-hour broth culture died in 72 hours, but a guinea-pig inoculated with 1 c.cm. lived until the fifth day of infection. Claudius [3] claimed virulence for a guinea-pig within a few days, and found abundant gram-negative bacilli in the heart's blood. We found that the post-mortem appearance of the rabbit was distinctive of an acute infection, and showed an extensive hæmorrhagic peritonitis with matting together of the intestines. There was also a purulent pleurisy with pericarditis and a slight enlargement of the spleen. Examination of the interior of a piece of intestine showed no suggestion

of superficial ulceration of the mucous membrane. There was no distinctive feature in the post-mortem appearance of the guinea-pig. Control animals inoculated with stock *B. enteritidis* died after 48 hours. No hæmorrhagic peritonitis was seen in the control rabbit, and nothing distinctive was noticed in the post-mortem appearance of either control animal. Gram-negative bacilli were recovered from the heart's blood and peritoneal exudate of the animals and the controls, also from the spleen of the guinea-pig in the former. They showed the same morphological and cultural characteristics as the original bacillus in every case. The biochemical reactions were identical. Similar agglutination reactions were obtained: complete with 1:8000, negative with 1:16,000 and 1:32,000, and partial with 1:64,000 of Gärtner agglutinating serum.

OTHER RECORDED CASES

Those cases of meningitis which have been recorded in the literature as being due to *B. enteritidis* Gärtner can be divided into two groups: a primary group, where isolation of the bacillus has been pure; and a secondary group where a mixed infection has occurred. Examples of the latter are afforded by the two cases published by Opitz.[10]

The first, a rachitic infant of 18 months, came under treatment for a pneumococcal empyema and subsequently developed a fatal meningitis. Strains of *B. enteritidis*, pathogenic for rabbits, agglutinated by Gärtner serum to its maximum titre (1:1600) were obtained from blood culture on two occasions during life, but only pneumococci were isolated from the cerebro-spinal fluid. *B. enteritidis* was however recovered from the spleen at post-mortem.

The second, a badly nourished child of 15 months, who had previously had an attack of broncho-pneumonia, was admitted to hospital with a history of three weeks fever and convulsions. At the first lumbar puncture meningococci alone were isolated, but on the last day but one before death, in addition to intracellular and extracellular meningococci, many small gram-negative rods were detected on an examination of a direct film of the cerebro-spinal fluid. By cultural methods no meningococci were grown; only *B. enteritidis* colonies, which were proved to be such by animal inoculation and agglutination to titre with Gärtner serum. Although Opitz failed to find the source of infection in these cases, he claimed that they were due to real infection with *B. enteritidis*, yet the signs and symptoms in the first case could have been ascribed to the pneumococci and in the second case to the meningococci.

The primary group mentioned above is represented by the case of Stuart and Krikorian,[14] who in 1926 identified *B. enteritidis* by fermentation and agglutination reactions in a fatal case of meningitis in a boy of 11 years, occurring during a typhoid epidemic in Jerusalem. The cases of Pesch [11] in the same year and of Smith [13] in 1921 seem to have been cases of enteritis complicated by meningitis; that of Claudius [3] in 1926 primarily a *B. coli* pyelonephritis followed by a pyæmia and terminating in a fatal meningitis. Gram-negative bacilli were grown on culture of the cerebro-spinal fluid from these patients; the bacilli were agglutinated to the limit of the titre of Gärtner serum employed (1:5000 in the case of Claudius [3] and 1:6400 in the case of Pesch [11]).

COMMENTS

It is evident from the clinical and bacteriological findings that this was a case of primary meningitis due to *B. enteritidis* Gärtner. No gastro-enteritis was shown to have been present. The patient was the weaker of twins and the other remained healthy. No case of similar infection has been reported in the family. The source of infection has not been found.

It should be noted that the chloride content of the cerebro-spinal fluid was greatly below normal in this case of meningitis; the very low figure of 505 mg. per 100 c.cm.[6] suggested at once the diagnosis of tuberculous meningitis, but no tubercle bacilli were found, and all other findings supported a pyogenic organism as the infecting agent.

The case of the infant described ran a course parallel with others reported in the literature and ended fatally.

Our acknowledgments are due to Dr. H. C. Cameron for permission to publish the case; to Prof. John Eyre, in whose department at Guy's Hospital the investigations were made; and to Dr. C. K. Simpson who conducted the autopsy.

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CONGENITAL STEATORRHŒA

BY E. A. COCKAYNE, D.M. OXF., F.R.C.P. LOND.

PHYSICIAN TO THE MIDDLESEX HOSPITAL; PHYSICIAN TO OUT-PATIENTS, HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET

THOUGH the following case of congenital steatorrhœa was incompletely investigated, Sir Archibald Garrod considers that it should be placed on record on account of the great rarity of the condition.

The patient, a girl, was born in 1921, of English parents unrelated by blood. When she first came to the Hospital for Sick Children, Great Ormond-street, in August, 1923, at the age of 1 year and 10 months, she was the only child, but her father told me in June, 1933, that two more children were born subsequently, a boy, aged 7 years, and a girl, aged 14 months, both of whom are normal. She was fed on Glaxo for the first ten months and was constipated, but after she was given a mixed diet the stools became loose. She began to walk at the age of 1 year and walked well at 1 year and 8 months. In December her mother brought a stool, which was shown to me by my clinical assistant. It was like a pat of butter, yellow and semi-transparent, and had a strong rancid smell. In answer to my questions the mother said that the stools had resembled melted butter ever since her change of diet at 10 months, and that oily fluid was passed both with the motions and with flatus. The infant weighed 17 lb. on August 20th, and 19 lb. on Oct. 22nd, but after that her weight remained stationary until Dec. 3rd, though her general health appeared to be good. In order to have the stools analysed with the child on diets containing various known quantities of fat, the parents let me take her into the hospital and Dr. Robert Hutchison kindly lent me a cot, but before these and other investigations could be carried out she was taken home again.

She was intelligent and, though small for her age, she was active and well-nourished with a good covering of

subcutaneous fat. The liver was easily palpable, but no other abnormality was discovered, and the urine contained neither sugar nor albumin. During her stay in the hospital some of her stools were chocolate-coloured, others were typical "butter stools," and all had a rancid odour. While she was on an ordinary diet, the fat content of which was not accurately known, the following analyses were made:—

Date in Dec., 1923.	Fat per cent.	Fatty acid.	Soap.	Neutral fat.
4th	46·43	39·8	..	60·2
6th	72·28	58·56	..	41·44
10th	51·18	47·47	2·52	50·01
11th	43·50	53·09	3·43	43·48
12th	44·90	57·35	..	42·65

All the stools had a strong odour of butyric acid. No muscle-fibres were found in the only stool examined, though she was on a diet containing meat. The blood and urine showed a low diastase value, but the exact figures were not reported. Loewi's test was positive; the left pupil dilated after two drops of adrenaline (1 in 1000) were instilled. The lævulose-tolerance test gave the following result: At 10.20 A.M., before the lævulose was given, the blood-sugar was 0·109 per cent. Lævulose (10 g.) was given at 10.20 and the blood-sugar was 0·109 at 10.50, 0·107 at 11.20, 0·146 at 11.50, 0·146 at 12.20, and 0·199 at 2.40.

The white blood-cells numbered 6250 per c.mm., polymorphonuclears 18 per cent., small lymphocytes 73 per cent., large lymphocytes 7 per cent., mononuclears 1·5 per cent., eosinophils none seen, basophils 0·5 per cent. The child died rather suddenly of broncho-pneumonia with an extensive purpuric eruption in March, 1924.

OTHER RECORDED CASES

Only three families in which this error of metabolism has appeared have been recorded. In the sibship reported by Hurtley and Garrod[1] two boys were affected and one boy and two girls were normal, and the parents were first cousins. In that reported by Miller and Perkins[2] the third child, a boy, was affected; the first and second, a girl and a boy, were normal, and the parents were not consanguineous. In the sibship reported by Soecknick and Thoenes,[3] all the three children had steatorrhœa; the first and third were boys, the second a girl, and afterwards there was a miscarriage. The parents were first cousins. In all the patients the stools were abnormal from the beginning and "butter stools" were noticed at an early age, and though there was some difference in the way in which fat was utilised on low and high fat diets by members of the different families, fat absorption was imperfect in all of them. Miller and Perkins found no failure to absorb protein in their patient. In Hurtley and Garrod's patient protein absorption was normal and there were no undigested meat-fibres in the fæces after a meal of beef-steak, and in my patient also there were no undigested muscle-fibres after a meal containing meat. In the patient investigated by Soecknick and Thoenes, however, both fat and protein were imperfectly absorbed, though carbohydrates were fully utilised. The diastase in the urine was not excessive in any of the patients. There was one difference between Hurtley and Garrod's patient and mine, for in theirs Loewi's test was negative, while in mine it was positive.

The cause of the deficient absorption of fats or fats and proteins is obscure. In the case of fats, pancreon caused the splitting of a much larger amount without any corresponding improvement in their absorption, so that the defective splitting of the fats is not the causative factor. In spite of the careful investigation of three cases the nature of this error of metabolism is still unknown.

In none of the children with steatorrhœa was there any great lack of subcutaneous fat, and their general health appeared to be good. The elder of the two brothers seen by Hurtley and Garrod appeared to have suffered no ill-effects from the disorder at the age of 15 years. On the other hand, his younger brother died of measles and broncho-pneumonia, Miller and Perkins's patient died of broncho-pneumonia after the extraction of carious teeth, one of Soecknick and Thoenes's patients died of hydrocephalus and another died of broncho-pneumonia, and my patient also died of broncho-pneumonia. The high mortality and the frequency with which broncho-pneumonia was the cause of death may be only a coincidence, or there may be a real connexion between the error of metabolism and the liability to a fatal infection of the respiratory organs. Which explanation is the true one can only be decided when the life-histories of many more children with the disorder have been published.

The two additional families recorded since Garrod published his "Inborn Errors of Metabolism" support the view he then put forward, that congenital steatorrhœa is a Mendelian recessive affecting males more often than females. The ratio of males to females is now 5 : 2. Of the sibships 50 per cent. are the result of marriages between first cousins, but a more accurate estimate is obtained by taking the percentage of affected children arising from consanguineous marriages, and of these 71·4 per cent. are the offspring of first cousins. If this high percentage is maintained it will prove that the disorder is much rarer than xeroderma pigmentosum, ichthyosis congenita, and alcaptonuria, though in all probability there are other autosomal recessives, as rare or even rarer, which still await recognition.

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2. Miller, R., and Perkins, H.: Ibid., 1920, xiv., 1.
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BLOOD PRESSURE AND SUBARACHNOID HÆMORRHAGE

BY M. C. ANDREWS, M.D. CAMB.
HON. MEDICAL OFFICER TO THE HARROW AND WEALDSTONE HOSPITAL

LUMBAR puncture is the accepted treatment of subarachnoid hæmorrhage. But when and how often to puncture few agree. Practice varies. One physician will wait until the necessity to puncture is forced on him; another will act immediately; others will puncture daily as a routine. No principle has yet been enunciated.

The reasons for puncturing are two. First, to confirm the diagnosis, and secondly, to keep the extracerebral pressure below that of the blood in the intracranial arteries. This second aim indicates the guiding principle which has been almost completely overlooked—blood pressure.

It is generally agreed that a temporary rise in blood pressure is the usual cause of the onset of bleeding. But Gale appears to be the only person who has drawn attention to the course of the pressure after the hæmorrhage has begun. How completely a skilled observer may miss the significance of alterations in blood pressure is shown by the following quotation from Forbus:—

"There was said to have been some elevation of the blood pressure at the time the patient entered the

hospital, only a few hours before death, but one could hardly see enough in the heart to support the idea of chronic hypertension. The elevation of the blood pressure must have been of temporary nature, and under the circumstances an observation none too reliable."

I am convinced that the blood pressure is the most reliable guide to prognosis and treatment. The ideal is to know the blood pressure (1) before the hæmorrhage; (2) after the hæmorrhage has begun; (3) before lumbar puncture; (4) after lumbar puncture; and (5) at frequent intervals subsequently, the frequency being determined by the severity of the case. This was achieved in Case 11. A single reading, unless it is extremely low or extremely high, is of no value at all. Below I have set out the records of cases in which more than one reading was taken.

CASE 1.—Aged 44.

Blood pressure (B.P.) one hour after hæmorrhage	110
B.P. half an hour later	180
Died same evening.	

CASE 2 (Doubler and Marlow).—Aged 32.

After lumbar puncture (L.P.), 6½ hours after hæmorrhage	180/118
7½ hours after hæmorrhage	over 300/118
Died 10 hours after hæmorrhage began.	

CASE 3 (Green).—Aged 30.

1st day after hæmorrhage, before L.P.	170/95
L.P. 1st day.	
3rd day	145/95
Died 14th day.	

CASE 4 (Riddoch and Goulden).—Aged 44.

1st day after hæmorrhage, before L.P.	140/80
2nd " " " " "	140/80
10th " " " " "	140/90
Incontinence of urine began.	
11th day after hæmorrhage, before L.P.	170/105
12th " stupor, stertor, cyanosis; L.P.	
13th " died.	

CASE 5 (Cubitt).—Aged 57.

2nd day after hæmorrhage, before L.P. Becoming comatose	90/45
3rd day, L.P. Breathing, &c., improved after L.P.	110/75
5th day, after third L.P.	135/90
Operation. Died.	

CASE 6.—Aged 53.

2½ hours after hæmorrhage, before L.P.	160
3½ " " " " "	160
4 " " " after "	160
7 " " " " "	164
25 " " " " "	150
35 " " " " "	168
48 " " " " "	148
72 " " " " "	158
84 " " " " "	162
Second L.P.; hypostatic pneumonia.	
92 hours after hæmorrhage, after second L.P.	140
106 " " " " "	138
126 " " " died of hypostatic pneumonia.	

CASE 7.—Aged 33.

1st day after hæmorrhage, after L.P.	140
8th day, after daily L.P. and an epistaxis	115
Recovered.	

CASE 8.—Aged 42.

Before hæmorrhage	185
1st day after hæmorrhage, before L.P.	190/136
8th day	192/128
After medicinal treatment and rest in bed.	
Still in bed	144
Nine months later	195
Since then (?) leakage, hot weather	210
After one week in bed	170

CASE 9.—Aged 53.

Lumbar puncture daily.

	A.M.	P.M.		A.M.	P.M.
8th day	—	150	13th day	126	148
9th "	208	180	14th "	154	126
10th "	178	112	15th "	132	112
11th "	152	118	16th "	120	—
12th "	132	120			

Died from fresh hæmorrhage following lumbar puncture.

CASE 10.—Aged 47.

1st day, within four hours of hæmorrhage; secondary coma; before L.P.	200
1st day, after L.P.	192
2nd day, morning	176
" " evening	210
3rd day, morning	140
" " evening	94
Died.	

CASE 11.—Aged 25.

2½ hours after hæmorrhage—

P.M.		A.M.	
11.0	180	12.45	156
11.10	180	1.45	80
11.15	180	2.0	76
11.20	166	2.15	76
Lumbar puncture.		2.30	66
A.M.		2.45	?
12.15	165	3.0	Died

COMMENTS ON THESE CASES

1. *Initial fall due to shock.*—Gale says that immediately after the ictus there is a fall of blood pressure. He offers no exact readings to prove this, though the suggestion is reasonable. Case 1 does not prove the point, but certainly suggests a fall. For a woman of 44, and one who is capable of effecting a rise of 70 mm. in the following half hour, a reading of 110 is low.

2. *Therapeutic rise.*—A reaction follows in which the blood pressure tries to rise more quickly than the intracranial pressure. If it fails, so does the respiratory centre. If it succeeds, there is still a mechanical possibility of continuation of the hæmorrhage.

Case 2 shows a very gallant effort to withstand the rising intracranial pressure in a severe hæmorrhage. In Case 3 the first reading may have been made at the height of the rise. An attempt to return to the normal follows. Case 4 shows a rise to combat a fresh hæmorrhage. The failure of lumbar puncture to save the patient makes one wonder whether the rising blood pressure was not an indication to puncture on the previous day. The value of lumbar puncture is shown by the fifth case. For an old soldier of 57 a pressure of 90 mm. is alarming, and it looks as if the puncture was done just in time to allow the respiratory centre to give the heart more help.

Case 6 shows how the blood pressure can be relied on to indicate the intracranial pressure. The second lumbar puncture was done to confirm the conclusion arrived at from the blood pressure and clinical signs that the patient's deterioration was not due to a fresh hæmorrhage. The fluid drawn off was not under increased pressure and was less blood-stained than the first specimen. This was an unusual case in that the patient died from a cause other than medullary compression.

3. *Fall during recovery.*—The value of the observations in Case 7 is reduced by the epistaxis. They do, however, show the fall of blood pressure which occurs during recovery. Four lumbar punctures had been done between the two readings. Case 8 shows the value of medicinal treatment with prolonged rest in bed even in a case of premature arterio-sclerosis. Relaxation of the treatment and return to normal life probably means a return of high blood pressure.

4. *Terminal fall.*—The last three cases illustrate terminal failure. In Case 9 the process was slow and death was hastened by lumbar puncture. In Case 10 the fall went on for 24 hours; in Case 11 only for four hours. A terminal syndrome may be described, and is well illustrated by Case 11. The medulla is compressed and respiration fails. The temperature rises, perhaps owing to compression of the temperature-regulating area, perhaps owing to secondary hæmorrhages in this area. The heart beat, which has been becoming progressively slower, finally weakens and flickers. The blood pressure falls. When the blood pressure falls without the patient improving the situation is desperate.

DEDUCTIONS

It would be absurd to call the following remarks conclusions. Many more blood-pressure readings are needed, and it is still to be discovered what help can be obtained by attaching a manometer to the lumbar puncture needle. And when that has been done—medicine has no conclusion. But at least we can say that we had no guide to treatment, and now we have one that we may follow, as better than none—the blood pressure. One reading of the sphygmomanometer is almost certainly useless, and may be misleading. But a series of readings throws a flood of light on a dim path.

Among the records of some hundreds of cases of subarachnoid hæmorrhage I find that only two patients died of loss of blood. One of mine, Case 6, died of hypostatic pneumonia. Every other death was caused by medullary compression.

When, therefore, and how often shall we puncture? Immediately, to confirm the diagnosis, and it may be also to relieve the medulla. So long as the patient improves do not puncture again. The blood pressure will fall either immediately or after a temporary rise. But if, after the lumbar puncture, a rise in pressure is accompanied by signs of increasing distress, puncture again—and, if need be, again and again. Puncture before the blood pressure falls.

How much fluid should be taken away each time? Possibly measurement of the pressure of the cerebrospinal fluid may eventually help to solve this problem. In the meantime other observations must guide us. The cause of a subarachnoid hæmorrhage is the inability of the vessel wall to resist the difference between the arterial and the subarachnoid pressures. If the removal of fluid brings the subarachnoid too far below the arterial pressure, an increase in the hæmorrhage should occur. The amount of fluid withdrawn should therefore be enough only to bring the subarachnoid just so far below the arterial pressure as will allow the medulla to continue its functions: clinically, enough to cause a slight improvement in the patient, an improvement most easily judged by reduced cyanosis and more comfortable breathing. An immediate marked fall in the blood pressure is not necessarily to be expected. So much should be drawn off, and no more. I believe drawing off a few cubic centimetres at frequent intervals is a far safer and more valuable method than one copious drainage.

At all times watch and be guided by the blood pressure.

Three of the patients discussed were in University College Hospital. For kind permission to refer to these cases I am indebted to Dr. Charles Bolton (Case 1), Dr. Batty Shaw (Case 9), and Prof. T. R. Elliott (Case 10).

(*References at foot of next column*)

CARCINOMA OF THE LARGE BOWEL

AS THE DIRECT CAUSE OF ACUTE APPENDICITIS AND SIMULTANEOUS ACUTE INTESTINAL OBSTRUCTION

BY GEOFFREY E. PARKER, F.R.C.S. ENG.
SURGICAL REGISTRAR AT THE NATIONAL TEMPERANCE HOSPITAL; AND
DAVID B. ROSENTHAL, M.R.C.P. LOND.
RESIDENT MEDICAL OFFICER AT THE HOSPITAL

VERY few cases illustrating this sequence of events seem to have been described. Of three reported by F. O. Mayer,[1] the first was that of a woman, aged 70, with a six months' history of increasing pallor, loss of weight, and anorexia. In 24 hours there developed a fulminating attack of acute appendicitis. At operation, after the removal of the acutely inflamed appendix, a carcinoma of the cæcum was found and was later successfully resected. Mayer reports that the position of the carcinoma was the direct cause of the obstructed appendix. The second case may be summarised as follows:—

A man, aged 65, had for three months suffered from attacks of para-umbilical pain and loose evacuation of the bowels, with occasional fæcal incontinence. For four weeks he had had pain in the right iliac fossa, rapidly increasing in intensity during the 24 hours before admission. On admission there was found rigidity and severe pain in the right iliac fossa; temperature 37·8° C. and pulse-rate 76. At operation free pus was found in the general peritoneal cavity, and a hard mass was felt in the lateral abdominal wall. A gangrenous appendix was removed with some difficulty. On the following day the wound discharged fæces, and the fistula thus formed subsequently showed no signs of closing. At the end of eight weeks, after a stormy convalescence, a mass was palpable in the region of the fistula, and at laparotomy a mobile carcinoma of the cæcum was found for which a successful ileocæcal resection was performed.

The third of Mayer's cases was one of acute appendicitis with intestinal obstruction. At operation an empyema of the appendix was found and the site of the obstruction was at the splenic flexure: a string carcinoma. Some weeks later a Paul-Mickulicz resection of the splenic flexure was successfully performed. A cæcostomy had been done at the first operation.

Mayer's is the only apposite paper that we have been able to find.

THE AUTHORS' CASES

CASE 1.—A man, aged 44, was admitted to the National Temperance Hospital with a history of eight days' pain in the right iliac fossa. There was some nausea but no vomiting, and the bowels were open daily. There was no previous history of any abdominal disturbance. On examination a tender circumscribed mass was found in the right iliac fossa. Mr. H. J. Paterson operated, and through a stab incision over the apex of the mass found pus and inserted a drainage-tube. A small fæcal fistula developed but closed 14 days after operation. On the seventeenth day the patient complained of some abdominal pain, which was associated with slight lower abdominal

[1] Zentralbl. f. Chir., 1932, lix., 261.

(*Continued from previous column*)

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distension. Complete relief was obtained by enemata. Ten days later some purulent discharge recurred from the incision, but this ceased shortly, and he was discharged, at his own request, on the twenty-eighth day. At this time it was noticed that a mass was still palpable in the right iliac fossa.

One week later he was readmitted with the cardinal signs of acute intestinal mechanical obstruction, and a history of five days' colicky abdominal pain and absolute constipation. The abdomen was opened (G. E. P.) through a right paramedian incision. Free straw-coloured fluid was found and the terminal three feet of the ileum were very distended and œdematous, and the ascending colon collapsed. The cæcal region was involved in a hard mass to which the omentum was closely adherent, and one large and very hard gland was noted between the leaves of the terminal ileum. The possibility of malignancy was at this time suggested by one of us (D. B. R.), but the rarity of the coincidence combined with the patient's poor condition did not justify the time required for the performance of an ileo-transverse anastomosis combined with a proximal ileostomy; and the abdomen was closed after performing a valvular ileostomy and passing a slip of corrugated rubber down to the right iliac fossa on account of oozing.

The ileostomy functioned immediately and recovery was uneventful for 17 days, at the end of which time symptoms of obstruction returned and the ileostomy, which had been showing signs of closing, reopened. One day later there was a sharp rise of temperature, and the patient complained of severe pain in the right posterior axillary line and the right shoulder. There was no cough or rise in the respiration-rate, and physical and radiological examination of the right chest was negative. The white count was 53,000 (polymorphs 88 per cent.).

Aspiration in the tenth interspace, in the right posterior axillary line, yielded a thin pus containing streptococci, staphylococci, and *B. coli* at a depth of two inches from the surface. An incision was therefore made under local anæsthesia at this spot, and a large amount of thick pus was found under pressure. A drainage-tube was inserted. There was some recovery for the next two days, but on the third day a collection of pus was noted in the pelvis and left iliac fossa. Previous repeated examinations for this had been negative. The condition of the patient obviated further exploration, and death occurred that night—five weeks after readmission and ten weeks from the onset of symptoms.

At autopsy a gangrenous appendix was found lying in the retrocæcal abscess cavity. A direct extension of pus was traced upwards to the subphrenic space and into a large solitary abscess in the right lobe of the liver, into which the drainage-tube was inserted, and downwards into the pelvis and left iliac fossa. In the cæcum there was found a fungating growth which was obstructing the lumen of the appendix as it entered the cæcum and, continuing further, obstructing the ileocæcal valve. One large gland was found in the ileocæcal angle. No other metastases were found and there were no enlarged glands, either inflammatory or malignant, in the portal fissure. Sections of the growth and of the gland were those of a carcinoma of the glandular type.

CASE 2.—A man, aged 56, was admitted on Jan 7th, 1933, with a history of four weeks colicky abdominal pain and periodic attacks of distension. No loss of weight and no previous history of indigestion were recorded. On admission his tongue was clean and moist; there was no vomiting, and the bowels had been open daily. His temperature was 98·4° F. and his pulse-rate 84. There was gross small bowel distension, and a mass palpable and tender in the right iliac fossa. Radioscopy showed the distension ending at the ileocæcal valve. No abnormality was detected in the large bowel. The night temperature ranged between 99·2° and 100·2° F. The mass in the right iliac fossa was stony dull over its outer half, with an area of resonance over it nearer the midline. A diagnosis of appendix abscess was made, with the reservation that the mass might be a carcinoma of the cæcum. Liquid paraffin only and a light diet was prescribed in the hope that the mass and the distension would settle down.

There was no change in his condition for six days, during which time the bowels were open daily, and there was no pain except on pressure over the mass. At the end of this time the pulse-rate suddenly rose to 120 and the patient vomited twice. Operation was therefore decided on. The abdomen was opened (G. E. P.) through a right paramedian incision. Enormously distended coils of ileum at once presented, adherent to an inflammatory mass filling the right iliac fossa. The large bowel was apparently normal, and after gentle exploration foul-smelling pus was found coming from the region of the cæcum. This was carefully mopped up and a second gridiron incision made over the cæcum. Through this a tube was passed into the paracolic gutter and down into the pelvis, and a large de Pezza tube tied into the cæcum through which there immediately escaped a large quantity of foul gas and fluid green fæces. The paramedian incision was closed in the usual manner with interrupted sutures, a slip of rubber being inserted into the rectus sheath for 24 hours. His condition rapidly improved and in three weeks he was free of all physical signs, but the cæcostomy showed no signs of closing. It was decided, however, to wait for some time to see if it would close spontaneously.

By the beginning of April the patient's general condition was much improved, and the bowels were open normally nearly every day. The cæcostomy, however, had not closed, and it was decided that a further exploration should be undertaken to determine exactly the cause of the original obstruction, to remove the appendix, and to close the cæcostomy if circumstances warranted. On April 6th the previous paramedian incision was reopened (G. E. P.). One loop of ileum was found adherent to the underside of the cæcostomy. After freeing this the ascending colon was seen to be distended, and an annular carcinoma of the transverse colon was found about ten inches from the hepatic flexure. No glands were palpable in the mesentery, and no secondary deposits in the liver. An ileo-transverse colostomy was performed and the abdomen closed. No attempt, of course, was made to close the cæcostomy. During the next three weeks the cæcostomy rapidly narrowed down, and the bowels were opened twice or three times daily.

On May 18th the abdomen was reopened (G. E. P.) through the previous paramedian incision and the complete removal of the terminal ileum, cæcum, ascending and first part of the transverse colon, up to the anastomosis effected. Some small hard glands were palpable in the transverse mesocolon. A small drain was passed through the previous cæcostomy incision into the retroperitoneal space for 24 hours. The patient made an uninterrupted recovery but on the tenth day discharged some pus through the gridiron incision. He was discharged from hospital on June 14th.

Section of the appendix from this case shows evidence of chronic inflammatory changes such as one might expect to find after a comparatively recent acute attack of inflammation.

CONCLUSIONS

In the first case the course of events seems to have been as follows. A slow-growing and apparently symptomless carcinoma of the cæcum invaded and obstructed the appendix, giving rise to obstructive gangrenous appendicitis. This condition was masked by the fact that the patient did not present himself for treatment until the eighth day of the illness. After drainage of the retrocæcal abscess the condition settled down until further spread of the growth involved the ileocæcal valve and intestinal obstruction supervened. In retrospect it was noted that there had been a warning of the impending disaster in the week before his discharge from hospital on the first occasion. The second case closely resembles Mayer's third case and requires no further comment.

We wish to express our thanks to Mr. H. J. Paterson and to Mr. James McClure for permission to operate on and publish these cases, and to Dr. H. H. Sanguinetti and Dr. Cuthbert Dukes for their help and advice, and for the pathological reports and microscopic sections.

MEDICAL SOCIETIES

ROYAL ACADEMY OF MEDICINE IN IRELAND

AT a meeting of the section of medicine on Oct 20th, with Dr. W. G. HARVEY, the president, in the chair, a case of

Spontaneous Hypoglycæmia Associated with Hepatitis

was reported by Prof. HENRY MOORE, Dr. W. R. O'FARRELL, and Dr. J. M. HAYDEN.

The patient was a woman, aged 40, admitted to hospital in coma without convulsions. The previous or family history revealed little of importance beyond occasional attacks of disorientation and loss of memory during the previous three years. The physical examination also showed little, apart from the coma and slight anæmia. On repeated determinations the blood-sugar varied from 25 to 29 mg. per 100 c.cm. An injection of 50 g. of glucose intravenously caused it to rise to 238 mg., and consciousness returned for some hours; but not withstanding glucose administration by mouth and rectum the blood-sugar fell again and the patient died about 12 hours afterwards. Post-mortem examination revealed nothing abnormal except a subacute widespread hepatitis. The liver was normal in size but soft and mottled. The pathological report on it was as follows: "The characteristic lobulated appearance of the liver is almost lost, and the pattern is more cellular than normal. The existent individual liver-cells are prominent and are markedly separated from each other, but many cells have been destroyed or are almost completely degenerated with loss of nuclei; the destruction is of single cells or small groups of cells throughout the whole organ; a striking feature is however the prominence and variation in the size of the nuclei, a considerable number of which are large and hyperchromatic, some show mitotic figures, and many liver-cells contain two nuclei. These changes are not confined to any particular part of the lobule." The pancreas was normal.

The changes in the liver were interpreted as due to a subacute parenchymatous hepatitis with destruction and degeneration of liver-cells. The cause of the hypoglycæmia was thought to be parenchymatous hepatic degeneration of unknown ætiology interfering with the glycogenic functions of the liver.

Prof. J. M. O'CONNOR said that as far as he could understand the body temperature had fallen, and yet the blood-sugar had not risen. This suggested the possibility that there really was some infective process going on.

Dr. A. R. PARSONS asked why hypoglycæmia was suspected at all, and said he thought that the case was very like one of mild yellow atrophy, which had come on when the woman was pregnant. The conception of acute yellow atrophy had now been very much modified. He noticed that although the woman was unconscious on admission to hospital the Babinski sign was negative. In most cases when the patient was comatose the Babinski sign was markedly positive.

Dr. L. ABRAHAMSON thought the case showed quite definitely that the tendency to call every case of hypoglycæmia a case of hyperinsulinism was not justified; the two conditions were not identical. He was sceptical about cases in which hyperinsulinism was regarded as the cause of coma.

Dr. K. MALLEY said he had seen several cases of hypoglycæmia, and found that in many of them a positive Babinski sign was present. He thought that this might bear some relation to retention of water in the brain.

Dr. MOORE, in replying, said that when Dr. Hayden saw the patient on admission her condition led him to think that an overdose of insulin had been given. There was probably, he thought, only a step in between acute yellow atrophy and the condition present in this case. The attacks of unconsciousness had occurred before childbirth, and although they were undoubtedly aggravated by pregnancy he thought that pregnancy could not be held wholly responsible for them.

Dr. GEOFFREY THOMPSON read a paper on clinical syndromes in Bright's disease.

LONDON ASSOCIATION OF MEDICAL WOMEN'S FEDERATION

AN open meeting was held on Oct. 24th, when Prof. D. P. D. WILKIE gave an address on the

Surgery of the Colon

He said that disorders of the large bowel are among the commonest ailments which in general practice call for treatment. From the standpoints both of physiology and pathology the colon could be divided into two parts: the proximal part, reaching to the middle of the transverse colon, which is absorptive and therefore freely supplied with blood- and lymph-vessels; and the distal part, retentive and thus relatively poor in blood- and lymph-supply. Operations on the colon were rendered difficult, and unless special care was taken, dangerous because of its thin sacculated wall, its infective contents, and the tendency to gaseous fermentation within its lumen. To be successful, surgery must take cognisance of these special features and be planned accordingly.

Anomalies of development.—In the proximal colon, he said, variations in development are compatible with perfect health. It was derangement of function and not of anatomical position which interfered with health. If the proximal colon was regarded as a second stomach numerous and suggestive resemblances were to be found. The ileum represented the œsophagus, the cæcum the gastric fundus, the cæcal colon the body of the stomach and the pyloric antrum, and the cæcocolic tract the pyloric canal. Just as in the stomach, pathological changes were to be found for the most part in the lesser curvature and pyloric canal, so simple ulcer was practically always found on the medial border of the cæcal colon, just above the ileocæcal valve, and carcinoma at the cæcocolic sphincteric area. In the cæcum there was a tendency to non-obstructing fungoid carcinoma associated with marked anæmia, a condition strictly comparable with the fungoid growths of the gastric fundus. In the cæcocolic region of the ascending colon carcinoma of the scirrhous constricting type was common, as it was in the pyloric canal.

Speaking of the treatment of simple anomalies and disorders of the proximal part of the colon, Prof. Wilkie said that surgeons are apt to adopt too readily a mechanical outlook: on finding an unduly mobile colon to fix it; a tacked-down colon to free it; a dilated cæcum to plicate it or even excise it. As more was learnt about the physiology of the colon and its disorders, particularly those of its nervous mechanism, such operations would become less and less frequently performed.

In the distal colon anomalies of development were not so common, but two were outstanding. One was the presence of a very long loop of pelvic colon with a narrow intersigmoid angle, a condition which predisposed to recurring volvulus, best treated by resection of the greater part of the loop with end-to-end anastomosis; the other—the congenital megacolon of Hirschsprung—was due to an incoördination

of its nervous mechanism, a condition which, having defied a great variety of methods of surgical attack, had now yielded to ablation of the sympathetic nerve-supply of the segment of the colon involved.

Diverticulitis.—The occurrence of small diverticula in the wall of the distal part of the colon had long been recognised by pathologists. It was, however, only some 20 years ago that attention was drawn to the not infrequent occurrence of a tumour-like mass in the region of the pelvic colon, liable to be confused with carcinoma. This was an inflammatory pericolitis, resulting from a leakage of micro-organisms through thin-walled diverticula in the colon. In its acute phase the condition, which had been aptly likened to a left-sided appendicitis, should be treated on expectant lines unless a localised abscess developed and required opening. Occasionally, when only a small and accessible portion of the colon was involved, as demonstrated by radiography, the diseased portion might be resected.

Carcinoma of the colon.—Malignant growths were of frequent occurrence and usually of slow growth; lymphatic involvement was relatively a late feature. They offered, therefore, a most hopeful field for radical surgery. In a few cases early dissemination to the liver or peritoneum might preclude removal; these cases, however, were exceptional and formed but a small percentage of the total. It was thus of prime importance that in this, the most curable form of visceral carcinoma, we should strive on the one hand to get reasonably early diagnosis, and on the other to render our operative procedure as free from risk as is possible.

Prof. Wilkie proceeded to give statistics of 181 cases of carcinoma of the colon on which he had operated. The average length of history was over one year. In 80 cases the growth was irremovable by reason of metastases, and a palliative operation was all that was possible. In 20 cases a lateral anastomosis, short-circuiting the growth, was possible; in 56 cases a colostomy above the growth was performed; in 4 cases nothing could be done. In 101 cases a radical operation was performed.

He spoke of the location of growth, and described operative treatment suited to different types of cases. Avoidance of tension was the watchword of colon resection. He emphasised the importance of complete mobilisation of the portion of colon concerned; the division of the tænia on the colon if end-to-end anastomosis was decided on; the insertion of one row only of interrupted linen Lembert sutures in order to avoid as far as possible interference with the blood-supply of the approximated cut margins; and a cæcostomy opening to ensure that no gaseous distension of the colon occurred during the first week after operation. If these conditions are fulfilled the post-operative course should be uneventful. Twilight sleep with spinal anæsthesia gave perfect relaxation and rendered the operation easier and safer than any form of general anæsthetic.

A follow-up of the 101 cases in which Prof. Wilkie had performed partial colostomy for carcinoma showed that 41 patients are alive and well over three years after operation. As many of these were in a desperate condition when first seen it was clear that even with the relatively late recognition of the disease which at present obtained encouraging results from operation might be anticipated.

REVIEWS AND NOTICES OF BOOKS

Fractures

By PAUL B. MAGNUSON, M.D., Associate Professor of Surgery, Northwestern University Medical School, Chicago. London: J. P. Lippincott Company. 1933. Pp. 466. 25*s*.

THIS is one of the most satisfactory of the many books on fractures which have lately appeared. It is not so burdened with details about rare and unusual fractures as to confuse the student approaching the subject for the first time, and yet the practitioner confronted with his individual fracture problem will find here the information that he seeks; that is, he will be able to determine what are the chances of successful treatment with the equipment and skill available to him. Where very specialised methods, involving difficult operations, are recommended, sufficient detail is given to allow the reader to appreciate the principles, but the practitioner is warned against their irresponsible application. The description of the treatment of each fracture is preceded by an account of the anatomical and mechanical considerations to be borne in mind, and prognosis, both as to length of disability and as to ultimate recovery, is a feature. The more common forms of treatment, by extension, fixation in plaster, skeletal traction, and the common wooden splint are clearly described and illustrated. No one should have difficulty in following the details, since the text abounds with practical hints and, wherever a drawing can help the description, it is provided. No one method of fixation has been given undue prominence; individual fractures are treated by the method which Prof. Magnuson has found to work best, and this catholic outlook will enhance the value of the work in the eyes of many hospital teachers. It is always easy to cavil at certain of the methods described in such a book. For example, early mobilisation of fractures of the carpal scaphoid, definitely advocated here, is at variance with modern practice. Again, the figure-of-eight plaster bandage, illustrated on page 104, for the fixation of the elbow in flexion after reduction of a supracondylar fracture of the humerus, is a method that has been rejected by many surgeons when treating these fractures in children; the "upper" turn of the figure-of-eight, in a short arm, tends to pull forward the lower end of the upper fragment with risk of reproduction of the deformity. On page 291 Sinclair's wooden foot-piece is wrongly described as the Sinclair Skate device. The section on fractures of the spine is for the most part excellent, but in view of the importance now attached to transport of these cases in the prone position it is disappointing to find the older method alone described. The chapter on fractures of the skull has been contributed by Dr. Loyal Davis, professor of surgery at the Northwestern University Medical School, who has also written on the neurological aspect of fractures of the spine. Both sections are a pleasure to read, for he has cleared the subjects of the trammels of confusion and involved description common in most text-books.

Although the book contains 466 pages, the print is large and clear, and much of the space is devoted to admirable illustrations. No reader need anticipate that the book will be tedious or difficult to read.

The Physician's Art

By ALEXANDER GEORGE GIBSON. Oxford: The Clarendon Press. 1933. Pp. 237. 7*s*. 6*d*.

OVER 250 years ago John Locke, doctor and philosopher, wrote the fragment entitled "De Arte

Medicâ," in which he considered the nature of the healing art; it is possible that he intended to write later and on a much larger scale on the subject, and the wonderful "Essay on the Human Understanding" proves this would have been within his power. Dr. Gibson prints this fragment of medical philosophy in a dozen pages of his book, and expands it upon a basis of general beliefs and assumptions which will be admitted as trustworthy. The method employed is indicated by the various chapters on art and science, on diagnosis, prognosis, and treatment, on ethics, and on the personality of the doctor. In each section the author says something well worth saying, associated closely or otherwise with the text supplied, bringing to his assistance an intimate knowledge both of modern medical writing and of much general literature. Dr. Gibson's long and wide experiences as physician and teacher have given him an opportunity to look at all aspects of the medical art, both closely and in the large, and as a result we have a wise and suggestive work.

Treatment of Rheumatism in General Practice

By W. S. C. COPEMAN, M.B., B.Chir. Camb., M.R.C.P. Lond., Hon. Physician, B.R.C.S. Clinic for Rheumatism, Peto Place; Assistant Physician, West London Hospital, Children's Department, and Hospital of St. John and St. Elizabeth. London: Edward Arnold and Co. 1933. Pp. 215. 9*s*.

Dr. Copeman's book has many virtues, not the least of which is that it is readable. This is an achievement in a book on the treatment of rheumatism, for there is no one golden method applicable to the large group of rheumatic conditions. Success is achieved only by an intelligent all-round plan of attack. Each type of the disease demands a different method of approach and a book which does not lose sight of principles in enumerating details deserves praise. Dr. Copeman has for the most part succeeded in supplying such a book, but in some sections even he has been overcome by the mass of his material. For example, in the chapter headed "Medicinal" the reader would feel more encouraged to examine the large selection of drugs mentioned, including many whose constitution is obscured by trade names, if the quotations from Prof. Langdon Brown had preceded rather than ended the chapter.

The opening chapters of the book all deal with rheumatism in the child; then follow sections on acute muscular rheumatism, fibrositis, neuritis, and sciatica, after which the different forms of articular rheumatism are dealt with. The section on treatment, which is the main concern of the book, covers all the known methods of attack. After an introductory chapter on aims, there follow chapters on medicine, diet, vaccine and non-specific protein therapy, physical methods, manipulation, baths, colonic therapy, endocrine therapy, actinotherapy, orthopædics, and spa treatment; a short chapter at the end deals with prognosis and end-results. The chapters on physical methods and baths should make a particular appeal to the practitioner with the clear descriptions of treatment which can be carried out in the home. Dr. Copeman throughout shows a critical and balanced judgment. The chapter on manipulation suggests that this difficult but valuable method of treatment should be possible for many to practise with safety instead of as at present being regarded as the province of the few. The tone of the book is stimulating; it spreads an atmosphere of restrained enthusiasm which should encourage the practitioner to attack the rheumatic diseases with some hope of success. Such encouragement is essential in a field which has hitherto proved for many one of disappointment and failure.

Histopathology of the Teeth

and their Surrounding Structures. By RUDOLF KRONFELD, M.D., Professor of Special Histopathology, Chicago College of Dental Surgery, Illinois. Philadelphia: Lea and Febiger. 1933. Pp. 479. $7.

THIS short book is in refreshing contrast with many huge tomes and text-books dealing with special branches of dentistry. There has long been a need for a book devoted to the pathology of the dental tissues as apart from dental treatment, and the restriction has enabled the author to provide concise information. The result is an excellent manual; a bibliography at the end of each chapter adds to its value. Some omissions may be noted. Thus there is practically nothing about the pathology of odontomes except for a brief section on cysts, which some authorities would exclude from that category.

While treatment is outside the scope of the book, Prof. Kronfeld points apposite morals as to certain aspects of operative dentistry. His conclusion that the operation of capping the pulp has little physiological basis is interesting. The chapter devoted to findings in root canal operations contains some shrewd comments on the value of various methods. We note with interest that the condition of exostosis or enlargement of the ends of the root through a deposit of cementum occurs more frequently in vital than in non-vital teeth in the proportion of four to one. This suggests that the condition may not be due to infection. In referring to the statement, often made, that this condition may lead to such general sequelæ as blindness, deafness, or insanity, and that these conditions might be relieved by the removal of such teeth, Dr. Kronfeld pertinently remarks that positive proof of this is lacking. The analogy he draws between exostosis and callus formation following a fracture, noting the absence of any disturbances of the central nervous system in the latter condition, seems to us enlightening. The chapter on reparative processes in the permanent teeth covers a difficult but fascinating subject very completely. The book is profusely illustrated and the pictures are uniformly excellent.

The Life of Edward Jenner

Second edition. By F. D. DREWITT, M.D., F.R.C.P. London: Longmans, Green and Co. 1933. Pp. 151. 6*s*.

THIS bright and readable little biography has reached a second edition. It should do much to bring home to the public at large the virtues and the immense services to humanity of the "father of immunology." The Life which was begun by his friend Baron soon after Jenner's death, long since out of print, contains a vast amount of information and was very bulky; Dr. Drewitt has made full use of this and other sources, and has woven into this attractive little book with much sympathy, learning, and understanding.

Jenner, whose father was vicar of the village of Berkeley, in Gloucestershire, was born in beautiful country, and throughout his life no temptation could take him for long from his native place. From an early age he was strongly drawn to natural

history; at 9 he had a collection of dormouse nests, and also a much prized assortment of fossils. This flair for the study of natural objects was evidently encouraged by his relations, and after going to schools in the neighbourhood he became at the age of 20 the pupil of John Hunter, then aged 41 and at the height of his activites. Hunter was Jenner's hero, and there can be little doubt that Jenner was one of Hunter's most favoured pupils. When Jenner returned to Berkeley, therefore, he remained in constant touch with his master who kept him busy coöperating in his investigations, in making accurate observations, and in applying the experimental method. Jenner thus was primarily a naturalist; and, as Dr. Drewitt points out, it was through the fortunate circumstance that Berkeley was the centre of a dairy farming district that the opportunity came to him of investigating cow-pox. The story of the genesis of vaccination is too well known to need repetition here. The classical experiment performed by Jenner on May 14th, 1796, when lymph, taken from a cow-pox vesicle on the hand of Sarah Nelmes the dairymaid, was inoculated in two places on the arm of the boy James Phipps, and the subsequent demonstration of the latter's immunity to small-pox by direct inoculation of small-pox virus is perhaps the most beneficent instance of the application of the experimental method hitherto on record.

Fortunately for humanity Jenner was a doctor as well as a naturalist, and the application of his discovery on as wide a scale as possible became thenceforth a self-imposed duty for the rest of his life. The difficulties that he encountered and the attacks made on him were not without effect—witness a remark in his pocket-book "Among the vulgar—the great and little vulgar—nothing is recorded of vaccination but its imperfections. Its benefits pass by and are forgotten." But Jenner lived to see the triumph of vaccination and the acknowledgment of its immense value in preventing small-pox all over the world. If ever a man for reasons of personal service to humanity at large deserved to be buried in Westminster Abbey, Jenner deserved this honour, but, like William Shakespeare, he is buried in the church of his native place. This would undoubtedly have been his own desire.

The German Jew

His Share in Modern Culture. By ABRAHAM MYERSON and ISAAC GOLDBERG. London: Martin Hopkinson, Ltd. 1933. Pp. 162. 3*s.* 6*d.*

WRITTEN to demonstrate the share in modern culture of the German Jew, everyone will agree with the first words of the preface in this book, that if we lived to-day in a fully civilised world there would be no need to write such a book at all, as all human achievement, which counts for good to the world in general, however founded upon national or racial characteristics, should rise above the limitations of nation or country. Brief chapters follow on the biological and political dilemmas traceable to the fact that the Jew has, through most of historic time, been a nation without a country, and the association of this situation with the anti-semitism which has recently broken out in Germany is obvious. An attempt at the comparative valuation of genius is sketched by an analysis of the recipients of the Nobel Prizes, the winners being used rather amusingly to show that in the competition for these prizes 10,000,000 Jews have shown themselves, since the institution of the Prizes, to be the intellectual equivalents of 60,000,000 Germans—that is to say, that the Jews, being 1 : 6 numerically of the German population, have run neck by neck with the rest of Germany as Nobel prize-winners. In chapters detailing the prominence of the German Jew in various vocations, the authors have no difficulty whatever in showing the enormous debt which medicine owes to them as innovators, discoverers, theorists, systematisers, and appliers, thus fulfilling in their sphere the requirements of scientific medicine. The German Jews furnish more than their full quota of great and talented medical men, while in the sciences of mathematics, physics, and chemistry the carefully dated and documented lists, put forward in the book, prove that the same conclusion can be come to. In literature, including journalism and drama (with its exposition on the stage), in music, and in art—in each of these categories the names of German Jews are prominent and often world-known; in enumerating them the writers, who hold professorial rank in the United States, are brief and speak with moderation and detachment.

We have here a judicious and well-informed summary of what Jews have contributed to the science and art of the world while owning German nationality. But Germany, in response to the call of patriotic emotion, would appear to have forgotten these things.

Modern Theories of Development

By L. VON BERTALANFFY. Translated and adapted by J. H. WOODGER. London: Humphrey Milford, Oxford University Press. 1933. Pp. 204. 8*s.* 6*d.*

MECHANISTS started with the assumption that life was a collection of physico-chemical processes, vitalists thought that it was a philosophical problem. Between the two, few people realised that it was a thing of itself and that biology was an independent science whose business it is to study life as such. The authors argue that such is the present working truth. They take their data from development and experimental embryology, but as they point out they might as well have come from any department of physiology or, we may add, pathology. The book is rather stiff and awkward in style but it puts its case well enough.

Medical Entomology

By R. MATHESON, Ph.D., Professor of Entomology, New York State College of Agriculture, Cornell University. London: Baillière, Tindall and Cox. Pp. 489. 29*s.*

AN eminently readable and well-balanced introduction to what has grown into an immense subject; the technical details of morphology are comfortably subordinated to the practical applications in which the hygienist is interested. The author's style is such that he conveys a great deal of information in few words without any tendency to degenerate to shorthand; his book is therefore pleasant to read as well as useful for reference. The magnification of the figures might well have been indicated more precisely; when one is looking for or at something one has never seen before, it is essential to have some idea of the size.

THE "History of Urology," in two volumes, by E. G. Ballenger and others, reviewed in THE LANCET of Oct. 28th, is published in England by Messrs. Baillière, Tindall and Cox.

THE LANCET

LONDON: SATURDAY, NOVEMBER 11, 1933

THE PATIENT WHO CANNOT PAY

A MAN visits his doctor and is found to be approaching one of the preventable breakdowns of middle life. He needs surveillance and is told to return at monthly intervals for advice. What are the prospects of his doing so? If he is poor—and many people are poor—the prospects are almost hopeless. Yet here is a doctor anxious to do the work he can do well, and here is a man anxious to profit by it; they are separated only by a fault in financial organisation. The practitioner gets into difficulties because he cannot sell his knowledge, and the patient is unnecessarily ill because he cannot buy it. We are back at the situation now so familiar—the situation too truly defined in the words "starvation in a world of plenty." Fortunately, however, the failure to solve the general problem of under-consumption does not imply an equal failure to solve the particular problem of patient and doctor. It is perfectly possible to bring these two together—under a system of insurance; and the time is undoubtedly coming when every member of the working classes will get medical care on this basis. The only question really left for the private practitioner to decide is whether he shall anticipate future developments and so secure his proper place in them. At present he complains, with reason, that hospitals and clinics are encroaching on his legitimate sphere of action, and he hopes perhaps that the complaints will prove effective. But he will never get redress in this way; for the underlying cause of the encroachment is that he does not give the public what they want at a price they can pay—as individuals. There is little or no criticism of private practice in principle; almost everyone prefers that he and his dependants should live in the care of a family doctor whom he knows and trusts. But if a man has no simple insurance system to rely on, the burden of illness, already heavy enough, always carries another burden of medical fees; and the average person of small means only shows good sense if he thinks of emergencies and puts his faith chiefly in some contributory scheme. The result, however, is that organisations like the Hospital Saving Association are innocently aiding the destruction of family practice among the industrial classes.

In course of time, presumably, the present National Health Insurance scheme will be extended to cover the wives and children of those now insured—an extension which the British Medical Association has already demanded. It may be long, however, before this happens, and meanwhile the general stimuli of public demand and professional need are causing local reactions. The result of these reactions, in more and more parts of the country, is a "public medical service" run by the practitioners themselves. In their simple form these are merely organisations which abolish ordinary fees in favour of a regular small subscription; the benefits offered to members are the ordinary benefits conferred by the family doctor; the money is collected centrally, but neither patient or practitioner loses his independence. Since there are no contributions from employer or from the State, the members must find all the funds required; but in London, for example, it is found that payment of 4*d.* a week by each of them—with reductions for quantity within the family—is enough to provide a satisfactory standard of service, including medicines. The scheme, nevertheless, has its critics, and the London Public Medical Service came under heavy fire at a meeting on Nov. 2nd to which all practitioners in London and Middlesex counties were summoned. Although it is seven years old and contains over 900 doctors this particular service is making little headway and wants to extend its activities. Last July the B.M.A. declared its approval of such extensions provided certain conditions are observed, and one of these is that they shall be approved as "in the public interest" by a meeting open to all practitioners in the area affected. Dr. ALFRED COX had comparatively little difficulty in showing that the L.M.P.S. is valuable to the public; the doubts concerned its value to the doctor. But now was the opportunity, he urged, for the profession to prove it could organise a service without lay administration, and to grasp this opportunity would be the best answer to municipalities which were extending their clinics, and hospitals which bragged about the number of their out-patients. Dr. E. A. GREGG, chairman of the service, spoke of its helpfulness in negotiation with public bodies. It is no use, he said, to keep on pointing out that economy and efficiency are better served by the practitioner than by out-patient departments unless one can show that means are offered by which the patient can pay. The private practitioner has got to prove that there is no form of practice he will not tackle if given a chance—and the public medical service gives that chance.

The value of fair contract rates as an object lesson, the stability conferred by a regular source of income, and the advantages of medical autonomy—all these were generally admitted by the meeting. Very real opposition, however, developed over the question of advertising and the possible use of agents. Some of the public medical services have made no attempt at publicity by any method except personal contact between doctor and patient; but others, including the London one, find they can make little progress without a direct appeal through the press. At first an insurance scheme of this kind attracts an undue proportion of patients who are permanently or frequently ill, and its full advantages to the practitioner do not appear, it is said, until he has a list of something like 200. In these circumstances advertising may well make all the difference between success and failure, and supporters of the services were able this year to persuade the

Representative Body of the B.M.A. that it is necessary and desirable, though a motion to prevent employment of agents was barely defeated. Last week's London meeting was quite firmly discouraged from discussing the question at all; it was told that its duty was merely to say whether the service is or is not in the public interest. But thanks to the determination—indeed, heroism—of Dr. ROBERT CARSWELL, of Wandsworth, the issues were defined, and even decided by vote. Assurances were given that the so-called agents were merely collectors of subscriptions, and in no circumstances would be allowed to tout for patients. Nor would any practitioner in the service be within his rights in seeking new patients on his own account, whether directly or by putting "member of the London Public Medical Service" on his surgery door. Moreover, when the central office is asked for information it refers the patient to his own doctor, and does not pursue him further. There is, indeed, a possible arrangement by which a patient joining the scheme can continue to attend a doctor outside it, on the basis of the "own arranger," but this does not seem to be in action. Failing such an arrangement, successful advertising of the service will undoubtedly tend to drive all the local practitioners into it willy nilly, and Dr. CARSWELL won much support for his amendment approving it provided that it "neither advertises in the lay press nor employs agents for the purpose of bringing the scheme to the notice of potential subscribers." The majority of those present obviously preferred that knowledge of the service should be spread only by doctors to their patients, and Dr. CARSWELL'S amendment was on the point of being carried when Dr. GREGG made his impassioned and final appeal. The fallacy lay, he said, in supposing that all the people of London belong to some particular doctor. This was nonsense. The Hospital Saving Association was gaining new subscribers at the rate of 100,000 or 150,000 a year; most of them had no intention of going near a private practitioner at all; and it was a matter of urgency to stop the drift into hospital contributory schemes. The meeting so far agreed with him as to pass Dr. H. M. STRATFORD'S motion approving the service and recommending it to practitioners.

THE ATTACK ON THE SLUMS

Sir HILTON YOUNG has announced that the reply of the local authorities to the Government's call for action will be a programme for clearing away more than 200,000 houses and rehousing more than a million people, at a cost of about £95,000,000. This is an estimate of the whole programme of the five-years plan based on the returns already received which cover three-quarters of the population, and the Minister claims it as a very big objective. And so indeed it is. But how far short it would fall of solving the housing problem will be realised when it is considered that this programme represents only a substitution of new houses for old to the extent named; it makes no contribution towards the provision of the additional low-rented accommodation required in every part of the country for the relief of overcrowding elsewhere than in the particular dwellings marked for demolition. The extent of this overcrowding and the amount of new housing necessary for its relief have been variously estimated. Sir Ernest Simon, M.P., in his book on the "Anti-Slum Campaign," reviewed last week in our columns, takes the numbers of dwellings and of individual families from the 1931 census, and arrives at a requirement (at that date) of 830,000 low-rented dwellings, to which he adds 750,000 and 190,000 for the estimated increase in families from 1932–41 and 1942–51 respectively. This gives him a total of about $1\frac{3}{4}$ million houses required during the next 20 years—one-half to meet the existing shortage, the other half to house the families which will come into existence during the period. This is in addition to the "millions of new houses" needed for the replacement of slum property and the rehousing of its dwellers.

A census family is "a person or group of persons ... in separate occupation of any premises or parts of premises" a lodger being so treated when boarding separately. It cannot be necessary for every such group however small to have a separate house, particularly as under the above quoted definition there must be a tendency for grown-up sons and daughters of families leaving home to be enumerated as separate units. If Sir Ernest Simon's estimate errs on the high side it may well be that the estimate of Mr. Philip Massey recently published in the *Architects' Journal*, brings out too low a figure. Mr. Massey's calculation, also based on 1931 census figures, attempts to measure housing needs by taking regard both of overcrowding and of unfit houses. An individual analysis is made of the census figures for London, for each of the 11 largest provincial cities in England and Wales, and for the three largest Scottish cities; and the line between the overcrowded and the not overcrowded is drawn for purposes of convenience at the standard of one and a half persons per room in England and Wales and two persons per room in Scotland. The resultant figure of new houses required is then multiplied by a factor based on the assumption that housing conditions in the rest of the country (ranging from cities of about 250,000 to the smallest rural areas) are one-half as bad as in the cities investigated. On this basis the needs of Britain, including abatement of overcrowding and replacement of insanitary dwellings, amount to 1,400,000 houses. But Mr. Massey's assumption that housing conditions in the smaller towns and in rural areas are only half as bad as in the large cities is seen to be too optimistic in the light of the housing supplement, just published, to Dr. J. M. Mackintosh's report on the health of Northamptonshire for 1932. It is not an account of *all* the unsatisfactory dwellings in the county, and Dr. Mackintosh admits that his sanitary inspectors might find the standard of housing he proposes too low rather than too high. Nevertheless, as a result of his personal inspection of 4056 houses out of a total of 59,082 structurally

separate dwellings in the county, he found it necessary to condemn 1949 and to schedule 1573 for reconditioning. There is no reason to suppose, he remarks, that the houses in Northamptonshire are worse than elsewhere.

Public opinion on housing conditions has been slow to awake, partly from sheer ignorance of the terrible facts of the real situation of so many working-class families, and partly because the complexity of the problem and the difficulty of finding an agreed remedy are such as to deter all but the most determined reformer. But public opinion has made some definite strides in the last few years and its advance is rapidly gaining in force and speed. The man in the street is beginning to realise two things: first, that the millions of public money poured out for housing since the war have benefited hardly at all the lower-paid working classes; and secondly, that the conditions under which these classes live are not only intolerable for decent people, but a national danger and disgrace. "There are many dilatory pleas," writes Dr. Mackintosh, "which can be maintained against housing reform. . . . The best refutation is personal investigation. In my own inspections I have been moved to anger and resentment at the conditions under which many of our fellows live." Something of this resentment seems to have made itself felt at the East Fulham by-election.

Sir Ernest Simon finds fault with the present Government's policy on two main counts. First, that the whole conception of slum clearance is essentially wrong at this stage; sufficient additional accommodation at low rents should be created to cure existing overcrowding, and only if that has been accomplished should clearance be undertaken. In other words, the quantity stage of the problem must be tackled first, the quality stage later. His second major criticism is levied against the plan to accomplish as much as possible through private enterprise. He holds that the proper function of such enterprise is to build houses for the occupier-owner; the lower-paid workers can never be housed by enterprise which "at best cannot build houses to let at less than 14*s.*, including rates." Moreover, the planning, lay-out and design of the council houses is superior because of the more usual employment of architects, and the buildings themselves are of better quality because the houses are not being built just to sell at a profit but for permanent ownership. There is saving in rent too, because the local authority can borrow money more cheaply than private enterprise. Further, it is doubtful, he thinks, whether private enterprise is willing to build houses for letting at all. A different view of the problem and its remedies is in a pamphlet "The Housing Problem: a Concise Survey," just issued by Sir Francis Fremantle, as a guide to local authorities and their health officers. Sir Francis writes on housing with an authority which cannot be called in question, and his experience as a county health officer lends weight to what he says. His sympathetic outlook is well illustrated by the description of slumdom which we quote elsewhere (see p. 1117). He defines the Government's policy as to concentrate public effort and money on the clearance of the slums, and to rely, in the main, on competitive private enterprise to provide new working-class houses other than those to be built for slum replacement. The question is whether private enterprise will find sufficient incentive.

What then is the chance of any reasonably speedy resolution of our housing difficulties? We believe that what purely commercial private enterprise will not attempt and could not achieve, and what the local authorities, fully occupied with slum clearance, will have their hands too full to undertake, could be accomplished by energetic utilisation, on the lines recommended in the report of the Moyne Committee, of the form of philanthropic enterprise represented by the voluntary housing movement. A central public utility council set up on a statutory basis and provided with national finance would stimulate the establishment of housing societies in every part of the country. The local societies, working through the local authority, would acquire overcrowded semi-slum property having a prospective life of not less than 20 years, and would be enabled by means of a subsidy smaller than that of the 1930 Act to build for the purpose of rehousing the surplus of the overcrowded population in the acquired properties. Both Sir Ernest Simon and Sir Francis Fremantle, widely though they differ as to the proper long-range policy to be adopted to solve the housing problem, are agreed on the necessity for sympathetic management on Octavia Hill lines. Both again view with sympathy schemes of differential renting, a method which appears likely to afford a means of providing decent homes for those unable to pay an economic rent that is superior to and much more economical of public money than any system of flat-rate subsidy. The operations of the voluntary societies offer an admirable field for putting into practice schemes of this kind and provide a convenient half-way house between, on the one hand, competitive private enterprise which cannot come into operation where no commercial profit is in view, and, on the other, the vast increase of municipal ownership involved in the assumption by the local authority of the duty of providing all the required low-rented working-class houses. Everyone with first-hand knowledge of the subject now agrees that provision of decent homes for overcrowded slum-dwellers does not, under skilled management, mean "coals in the bath." While in Dr. Mackintosh's phrase the descent of Avernus is easy, and while it is inevitable that a family forced into unhealthy conditions should deteriorate, nevertheless the percentage of failure to rise to decent levels, when the opportunity is provided, is very small. The task of re-education in the one case and of prevention in the other can be most speedily accomplished by giving skilled management its chance. That is the essence of the Moyne report, and it will only be by giving effect on a generous scale to that Committee's recommendations that the Government will be able to fill the gap in their housing programme.

SUBSTITUTES FOR THYROID EXTRACTS

Prof. HARINGTON'S synthesis of thyroxine was an achievement of obvious importance, and it is not his fault that it has so far been of little or no practical help to the clinician. Thyroxine, when injected intravenously, has an effect on metabolism which is almost mathematically related to the dose employed. But when it is given by the mouth its behaviour cannot be foretold. From the theoretical standpoint this discrepancy should not be ignored for, as Mr. TROTTER has reminded us,[1] the most fruitful advances in knowledge have come from the study of such irritating "residues." But from the therapeutic standpoint it is annoying, since no one suffering from myxœdema is going to submit to a lifetime of venepunctures when dried thyroid gland will keep him in comfortable health—however unscientific the latter method of treatment may be to the purist. For these reasons, among others, the search has been widely pursued for some stable stimulant of metabolism, suitable for oral administration, which would be free from the drawbacks of synthetic thyroxine and yet capable of more accurate standardisation than the present thyroid preparations. And this search has not been unfruitful. Not long ago CUTTING and his associates[2] found that dinitrophenol accelerated the basal metabolic rate, and suggested that it might prove to have clinical applications. Enthusiasm for this preparation has since been a little damped, however, by the evidence[3] that dinitrophenol is a dangerous drug—as was clearly pointed out when it was introduced. Pursuing a similar research, Prof. DODDS and Sir WILLIAM POPE have published a preliminary report[4] suggesting that dinitro-o-cresol, although of the same order of toxicity as dinitrophenol, gives the same effect with one-third of the dose. The risk of poisoning is accordingly proportionately reduced; but until much more is known about them the general use of such nitrobenzene derivatives is out of the question.

The work of Dr. ANDERSON, Prof. HARINGTON, and Prof. MURRAY LYON, described on p. 1081 of this issue, has been along different lines. Adopting the hypothesis that the erratic effect of thyroxine when administered orally is due to its extreme insolubility, they cast around for some more soluble derivative of the hormone. They find that 3:5-diiodothyronine fulfils this requirement, and at the same time has a marked and regular influence on metabolism when given by the mouth. It is a stable compound, easily prepared and capable of accurate standardisation; being in fact, the penultimate stage in the synthesis of thyroxine. So far there has been no evidence that it is toxic, but this, of course, does not mean that diiodothyronine can be prescribed light-heartedly. As an active preparation of thyroid it must inevitably cause unpleasant symptoms if given in sufficient quantity. At the same time the use of a pure substance, with its constant potency, has conspicuous advantages, and the time is not far off when "tabs. thyroid"—that old and trusted friend of the physician—will resign from the pharmacopœia in favour of a junior even more trustworthy.

[1] Trotter, W.: THE LANCET, 1933, i., 287.
[2] Cutting, W. C., Mehrtens, H. G., and Tainter, M. L.: Jour. Amer. Med. Assoc., July 15th, p. 193.
[3] Anderson, H. H., Reed, A. C., and Emerson, G. A.: Ibid., Sept. 30th, p. 1053; and Oct. 7th, p. 1171.
[4] Dodds, E. C., and Pope, W. J.: THE LANCET, August 12th, p. 352.

ANNOTATIONS

FLUCTUATIONS IN BLOOD COUNTS

THE stimulus to the questioning of "facts" accepted in medicine is often the discovery of new more perfect methods of investigation; at other times the technique remains unchanged and the challenge comes from those who have chosen to repeat classical observations. The mass of data which has accumulated round the blood count in normal and pathological conditions is the latest focus of critical attention. Doubt has recently been cast on the reliability of blood counts as heralds of damage following irradiation, notably in the tenth annual report of the British Empire Cancer Campaign,[1] on two grounds: (1) that very great variations in the blood count normally occur not only between different normal persons, but even in the same person at different times of the day, and (2) that when the blood counts of patients exposed to radiation were checked against controls (nurses) it was found impossible to establish any normal standard. For these reasons, it was held, variations in the leucocyte count could not safely be accepted as a warning of damage by rays.

These conclusions were based on work done respectively by Dr. R. H. Simpson and Dr. G. White Phillips under the auspices of the Campaign. Neither paper has yet been published with full clinical and hæmatological details, and criticism of the findings may therefore be premature. But since the conclusions have gained widespread publicity it is worth examining such of the data on which they are based as are accessible. Considering first those of Dr. White Phillips, his third conclusion[2]—"A low lymphocyte count was found in most of the cases of malignant disease, but the effect of the large doses used was very definitely not the production of a lymphopenia"—is perhaps the most important. Its basis must depend not on the percentages given in his first graph but on the absolute figures for lymphocytes; when these are calculated it appears that, contrary to his conclusion, the initial lymphocyte count was low (under 1400 per c.mm.) in only two of his nine malignant cases, and that in eight of the nine cases a fall in lymphocytes occurred even during the short period—less than two months—of observation. It is obvious that this work requires repetition on a much larger scale. But assuming it amply confirmed that no considerable changes occur in patients subjected to irradiation in large doses over a short period, this does not imply that workers subjected to very small doses over a long period are necessarily immune from the possibility of damage. The more serious heterodoxy is that voiced by Dr. Simpson, the acceptance

[1] See THE LANCET, July 15th, p. 138.
[2] THE LANCET, Sept. 30th, p. 745.

of whose conclusions would involve readjustment of current views not only on the effect of irradiation but also on the value of blood counts in general. For example, if, as he contends, the leucocytes of any person can fluctuate as much as 6000 per c.mm. in a quarter of an hour or 4000 in six minutes, the leucocyte count as a procedure of diagnostic significance would be largely discredited. Clinical pathologists should proceed to collect ad-hoc evidence on a large scale which will finally confirm or refute the relative stability of the leucocyte count and the extent and rapidity of its fluctuations in the normal subject. It must be remembered that Dr. Simpson is only the latest of a series of observers who, as a result of careful work, have cast doubt on the stability of the blood picture. Such doubts have been voiced from time to time by various workers without in the long run shaking the faith of clinical pathologists in the significance of the results they obtain or of clinicians in the interpretation to be placed on them. The conclusions of the orthodox hæmatologist when confronted by scepticism of this kind were well summarised by Prof. Eric Ponder and his collaborators in 1931.[3] They said :—

"Under conditions of moderate activity the large fluctuations in the total white-cell count described by Sabin, Cunningham, Doan, and Kindwall have not been observed. Those large fluctuations seem to be due principally to errors of method. The total white-cell count shows, however, small fluctuations not exceeding ± 8 per cent. throughout the day; these persist even after all errors of method have been allowed for."

Until overwhelming evidence is produced that Prof. Ponder is wrong, and that the stability on which great superstructures have been based is a mere delusion, it is safer to continue to assume a significance in pronounced variations of leucocyte counts, especially when dealing with workers in radiological departments. The reaffirmation, which we recorded in last week's issue (p. 1060), by the X Ray and Radium Protection Committee of the desirability of watching the blood picture of workers exposed to radiation will be welcomed by all who are concerned with the welfare of these workers. It is, at any rate since, if not because of, the general adoption of the recommendations of the X Ray and Radium Protection Committee that the health of workers in X ray departments has very definitely improved. Unfortunately all over the country X Ray departments still exist that have failed to bring themselves up to date in matters of protection. Until all X ray departments are well ventilated, and the workers properly housed —and the tendency to utilise basements for the work dies hard—the Protection Committee are well advised not to make any substantial alteration in the existing recommendations.

HOSPITALS AND LOTTERIES

LAST week the chairman of the Cromer district hospital and the organiser of the Cromer hospital carnival were summoned for having published in August a proposal for the sale of tickets in a lottery contrary to Section 4 of the Lotteries Act, 1823. Their scheme offered shilling tickets which to the purchasers meant three things—first a contribution to the hospital, second the right of admission to the grounds for the fête, and third the chance of winning a motor-car. The defendants had consulted the chief constable of Norfolk, who told them the scheme was a lottery and might involve a prosecution. They proceeded with the scheme and the hospital benefited to the extent of £880; prosecution followed. The defence contended that it had not been established that any purchaser bought a ticket in the hope of winning a car; the magistrates, however, found the case proved. There was no element of skill about the competition for the car; it was a mere chance or lottery. The bench, regretting that the chief constable's warning had been disregarded, passed sentence. The defendants were bound over to be of good behaviour for six months and were ordered to pay 10*s.* 9*d.* each towards the costs of the case. It is one more instance of what the Royal Commission on Lotteries and Betting called the derisory treatment by magistrates of prosecutions initiated under an archaic law. The Commission, it may be recalled, said the institution of large-scale lotteries was undesirable, the least objectionable form of lottery was a State lottery for the benefit of the Exchequer but this was not to be recommended, the existing prohibitions should be maintained (subject to exemptions for small-scale private lotteries such as the club members' sweepstake or the bazaar raffle), and the statutes should be rewritten in modern form. Whether this or any other Government will find time to tackle so thorny a subject it would be imprudent to hazard a guess. The Home Secretary declines to make any promise. The summons in respect of the Duke of Atholl's "appeal to sportsmen," to be heard on Nov. 14th, will clear up legal uncertainties and may expedite amendment and revision. The Royal Commission was substantially unanimous in its findings, but it is hard to forecast the answer Parliament might give to any particular proposals. In 1918 the House of Lords passed a Bill which would have enabled the governing body of any registered war charity, with the consent of the police, to raise money by lotteries; the House of Commons declined to give it a second reading by a narrow margin. In May, 1931, a private member was refused leave, by 181 votes to 58, to bring in a Bill to authorise raising money for hospitals by means of lotteries; the same member tried again a year later and his motion was carried by 176 votes to 123. Between those two events the British Hospitals Association had passed a resolution that it was not in favour of amending the law affecting public sweepstakes which purported to be for the benefit of voluntary hospitals. Few can doubt that, if such lotteries are promoted, there must be loss of individual support. The Irish Free State experiment should have furnished definite information on this point, but the Royal Commission had no very clear guidance from hospital managers in Great Britain.

GASTRIC ACIDITY AND PEPTIC ULCERATION

THE prolonged studies of gastric secretion by Vanzant and his co-workers [1] at the Mayo Clinic have been carried a stage further by the accumulation of new data on changes in secretion in various pathological conditions. About a year ago they published an analysis of nearly 4000 test-meal results in normal people from youth to old age.[2] Their present paper deals with the results in 1898 cases of duodenal ulcer, and also 188 cases of gastric ulcer in which an ulcer was demonstrated at operation. An equal number (188) cases of anastomotic ulcer following gastro-enterostomy are also presented. In analysing the results the investigators have utilised a relatively accurate method of estimating variations from the normal, and this takes into account the probable error in expressing the mean deviation from the normal in any given person. Actually, as they say, the range of normal is so wide that no reading can be

[3] Quart. Jour. Exper. Physiol., 1931–32, xxi., 35.

[1] Vanzant, F. R., Alvarez, W. C., Berkson, J., and Eusterman, G. B.: Arch. Internal Med., Oct., 1933, p. 616.

[2] See THE LANCET, 1932, i., 1158.

pathognomonic of any disease; but with the large numbers of "normal" and "abnormal" cases at their disposal they are able to draw certain conclusions. Using a one-hour test-meal of the Ewald type (eight arrowroot cookies and 400 c.cm. of water), they find that there is a considerable increase of free acidity over the normal in cases of duodenal ulcer—i.e., of about 12 c.cm. N/10 soda per 100 c.cm. gastric juice (or 12 units). In gastric ulcer, on the other hand, they find not only no increase in acidity, but actually a decrease below the normal of about 6 units. In 174 men suffering from gastro-jejunal ulcer after gastro-enterostomy the gastric acidity was lower than normal by about 4 units, being no higher than that of patients similarly operated upon who had not developed such ulcers. The figures bring out, therefore, the important finding that the presence of gastric or gastro-jejunal ulcers is not associated with hyperacidity, whereas that of duodenal ulcer usually is. They do not indicate what part gastric acidity may play either in the production or the persistence of peptic ulceration, but they suggest that perhaps this part may have been exaggerated.

MERCUROCHROME IN ASCENDING RENAL INFECTIONS

WHEN death follows prostatic obstruction its direct cause is most commonly infection of the kidneys. H. H. Young [1] has tried to combat this complication with Mercurochrome, and finds, first, that the method is not dangerous, and secondly, that small doses of the drug are often as effective as the large ones formerly employed. His practice is to begin with 10 c.cm. of a 1 per cent. solution, and after an interval of a day or two to increase the dose by 3 c.cm. Its administration is repeated if necessary at intervals of two or three days, the amount being increased on each occasion by 2–3 c.cm. In cases of a fulminating type the original dose of 5 mg. per kg. of body-weight (23 c.cm. of 1 per cent. solution per 100 lb.) is desirable. Mercurochrome may cause a transient albuminuria and intestinal irritation, but in Young's opinion it has never been responsible for a nephritis. The treatment gives better results in acute than in chronic cases and he finds it particularly effective in staphylococcal infections. The drug appears in the urine within a few moments of intravenous injection, and in an hour is found in such concentration that if the amount of fluid intake is limited, the urine has a distinctly bactericidal action.

THE FUTURE OF THE TUBERCULOUS CHILD

THOSE in charge of tuberculous children in hospitals and sanatoriums must often wonder what will have become of their patients a generation hence. An answer to this question is to be found in a laborious study recently conducted by Dr. J. Lundquist,[2] whose findings are published in two successive numbers of the transactions of the Swedish Medical Society. During the period 1910–20, the Söderby Hospital for the tuberculous, belonging to the municipality of Stockholm, housed 944 children of all ages up to 15 years. No information could be obtained about the subsequent fate of 18 of them (1·8 per cent.). Among the remaining 926, there were as many as 671 survivors. Information was obtained with regard to the health of 415 of these survivors in 1930 and 1931. It was found that 24·3 per cent. of all the children had died of tuberculosis. The tuberculosis mortality showed two peaks—the first and highest that of children infected in infancy, the second at puberty and just before it. Even during infancy, the disease must not, of course, be regarded as inevitably fatal; the tuberculosis mortality among the children infected during the first year of life was about 55 per cent. After the first year, the mortality declined rapidly, reaching its minimum (10–14 per cent.) between the ages of 3 and 9. The tuberculosis death-rate among the children admitted to hospital at puberty was about double that among the children treated at the earliest school age. More than half of the deaths occurred within a year of admission to hospital, and about three-quarters within the first five years. On the average, the pulmonary lesions were more serious among the girls than among the boys on admission. The mortality was also higher, and the course of the disease shorter, in the fatal cases among the girls. When the tuberculosis was open, the mortality was exceedingly high (87 per cent.); and open tuberculosis was twice as common among the girls as among the boys. No signs of active disease could be found in 78 per cent. of the re-examined, and all those interested in the tuberculous child should find encouragement in the high survival-rate and the number of children who became healthy adults.

[1] Bull. Johns Hopkins Hosp., 1933, liii., 1.
[2] Svenska Läkaresällskapets Handlingar, 1933, lix., Nos. 2 and 3.

DIVERTICULA OF THE SMALL INTESTINE

INTEREST in rare conditions like diverticula of the small intestine is seldom aroused except by some chance encounter with an actual case. Nevertheless, the fact that the current issue of the *British Journal of Radiology* contains a report on six cases of duodenal diverticula occurring in the practice of one radiologist,[1] while in the *British Journal of Surgery* Butler[2] records seven cases of multiple diverticula of the jejunum seen by himself, suggests that the possibilities of these disorders should not be buried too deep in our minds. As mentioned by Fraser,[3] who describes yet another case, diverticula of the duodenum are really a specialty of the X ray room, whereas those of the jejunum and ileum are discovered in the operating theatre. As is only to be expected, the difference in development, anatomical fixation, and physiological function of the gut above and below the duodeno-jejunal flexure is reflected in a distinction between the nature of symptoms and complications of diverticula at the different levels. Peridiverticulitis and diverticulitis may be found at any level, though they seem to be rare in the duodenal case, but the perforating diverticulum, and therefore the acute abdominal emergency, is characteristic of the gut below the duodeno-jejunal flexure. Thus Costello[1] did not find a single report of perforation from the duodenum. The "acute abdomens" are opened on a diagnosis of perforation of a hollow viscus, subacute intestinal obstruction, or, simply, peritonitis of unknown origin. Perforation of a diverticulum of the small intestine is one more possibility to be considered in the case of abdominal emergency which does not disclose its secret as soon as the peritoneal cavity is opened.

The symptoms of duodenal diverticula are those of "chronic indigestion," and are apt to last for years. Complaint is of pain across the epigastrium and in the back, with an uncertain relation to food, and there may or may not be vomiting. The diagnosis is made either at operation or during a routine X ray examination for peptic ulcer, and it should be noted that a diverticulum in the first part of the duodenum may owe its origin in the first place to a weak spot in

[1] Costello, C. D.: Brit. Jour. Radiol., October, 1933, p. 70.
[2] Butler, R. Weeden: Brit. Jour. Surg., October, 1933, p. 329.
[3] Fraser, I.: Ibid., p. 183.

the wall of the gut where there is an ulcer scar. In the second part of the duodenum, pressure on the bile-ducts is a complication to be feared. Jejunal diverticula have seldom been diagnosed during life, and their symptoms have been various; but certain points are characteristic enough to be worth recording. The pain does not seem to be severe, and is definitely noted as not being colicky—a fact to correlate with the absence of muscle in the wall of the diverticulum. A gurgling sensation—even a gurgling noise—in the abdomen is described with some constancy, and vomiting is common. The symptoms can usually be relieved by recumbency, a fact which Fraser explains as due to the effect of gravity in emptying the pouch of the diverticulum in this position. The X ray picture seems to be typical enough, consisting, as it does, of multiple cup-shaped fluid levels, with accumulations of gas above. On occasion the diagnosis has been made before operation, but this is the exception.

Speculation about the ætiology of these diverticula of the small intestine has been active. Duodenal diverticula have been explained on a developmental basis, and the discovery of pancreatic tissue in their walls seems to lend colour to the theory that one is dealing with an extra pancreas of arrested development. But as the diverticulum is always on the concave border of the duodenum, projecting towards the pancreas, and often adherent in some degree to that organ, it would not be surprising if a microscopically thin piece of pancreas were found attached to its wall. Diverticula of the duodenum are apparently single, but in the jejunum and ileum the condition is multiple and may affect the intestine for many feet—which complicates operative treatment. The diverticula arise along the mesenteric border of the gut, and in close relation to the position of the vasa recta. Distension of the lumen of the gut will produce diverticula in normal post-mortem material, and Butler explains this by showing that distension of the gut means tension on the mesentery. When the mesentery is overstretched there is a pull on the vessels running through it to the wall of the intestine and these in turn pull on the bowel wall. Thus the diverticulum, produced apparently by pulsion, is actually produced by traction. Arterio-sclerosis, by destroying the elasticity of the vessels, tends to increase their traction effect, and Butler has found his most striking examples in cases where the arteries have degenerated.

THE ISLETS OF LANGERHANS IN PREGNANCY

THE histogenic relationship of the islets of Langerhans to the acinar tissue of the pancreas has long been debated, and Dr. W. Cramer[1] has now added some significant information to what is known of it. Studying the appearances in rats and mice under different circumstances, he found, amongst other things, that the islets showed a greatly augmented cellular activity during pregnancy. A distinct new formation of islets amongst the acinar tissue could be observed, and he was able to trace the origin of these newly formed structures directly to the centro-acinar cells. That new islet tissue can develop in the pancreas during adult life has long been recognised and many attempts have been made, both by stimulating the gland and by exhausting it, to show a transformation of acinar tissue into islet tissue in the process. These attempts have brought conflicting and inconclusive results, and transition forms between islet cells and acinar cells have not hitherto been satisfactorily demonstrated. The centro-acinar cells of the pancreas, first described by Langerhans, are clearly distinct from the zymogen-containing cells of the acini, and Bensley has traced something of a relationship of them to the islet cells through the cells of the terminal ducts. Cramer has now observed what he regards as direct transformation of the centro-acinar cells into islet cells. The relationship of increased islet formation to pregnancy is interesting in that it may explain, as he remarks, the temporary improvement which is noted in diabetics during pregnancy.

[1] Quart. Jour. Exper. Physiol., 1933, xxiii., 127.

FRESH LIGHT ON STRONGYLOIDES INFECTION

WORK from Prof. E. C. Faust's parasitological laboratory in Tulane University, New Orleans, has added substantially to our knowledge of infection by the nematode strongyloides. H. A. Kreis[1] from the same laboratory had already reported the finding of the long-sought parasitic males of this worm in fæces of infected man and dog, and now Faust himself[2] using various strains of this parasite in 40 dogs has carried the investigation further. The main interest of his striking and far-reaching discovery centres in the lungs and air-passages. In them he has traced development from the filariform infective larval stage (that which gains access to the body by way of the skin) through a pre-adolescent stage in which male and female forms are distinguishable, and an adolescent one in which individuals are apt to migrate, or be carried, to the upper respiratory tract and nearly all levels of the alimentary tract, to a final mature stage in which both sexes are still present though in diminished numbers in the respiratory tract, and impregnated females in all parts of the alimentary canal except the appendix. The intestinal females are normally imbedded in the tissues—mainly those of the duodenum, jejunum, and upper part of the ileum—but are in moderate numbers in the cæcum, colon, and rectum, as also in the epithelium of the cystic duct. It is noteworthy that males have never been found in association with females in the walls of, or even attached to, the bowel. Such association is, however, common in the bronchioles where maturation of the sexes runs parallel. The conclusion then follows that it is in the lungs that impregnation takes place, a habitat for the female worm which, at least on occasions, was made known by the late Prof. Fülleborn some twenty years ago. Faust also produces evidence that in the two cases investigated the female intestinal worms retained sexual activity for about two months only, being soon afterwards set on by massed round cells and destroyed.

A reason for hesitating to accept these conclusions as directly applicable to man is our knowledge that the habitat of the same parasitic worm is not necessarily the same in different animals—that what is the rule in an optimum host is not exactly reproduced in a less favourable one. Such objection is at least greatly weakened by the fact that some of the infective larvæ used by Faust were from a canine strain, and that he reports no difference in behaviour between these and strains from man, ape, and monkey.

For some time past Japanese workers have been satisfied that the filariform and infective larval stage may develop within the intestine from the earlier rhabditiform stage, and that these filariform larvæ may forthwith enter the bowel wall and so presumably bring about continued and repeated auto-infection. By the action of such a strain, designated by Faust

[1] Amer. Jour. Hyg., 1932, xvi., 450.
[2] Ibid., 1933, xviii., 114.

as hyperinfective, are reasonably explained those infections which persist for many years in conditions in which ordinary reinfection through the skin can confidently be excluded, particularly in view of his experience as to the short life of the gravid intestinal female. These observations explain the notorious failure of ordinary intestinal anthelmintics in this infection. They do not reach the bronchial mucosa and, so far as their action is direct, they cannot anyhow affect the bronchial forms even if they can do those lying within the intestinal mucosa; so that they leave the source of the latter untouched. In 1928 de Langen, in Java, introduced gentian-violet for the treatment of this infection, with relief from symptoms and in some cases cure; while Faust himself reports [3] that the gravid intestinal females absorb the dye, become free from the mucosa and are expelled by the host; but that their eggs and young larvæ are not killed by the drug. This dye has, however, the significant effect of turning a hyperinfective type into a direct one, so that larval development to the filariform or infective stage does not take place until the stool has been passed for at least some hours, and auto-infection by way of the intestinal mucosa must accordingly cease. The effect of the dye on the pulmonary forms has not yet been reported; knowledge of this will be interesting and may be therapeutically valuable. At present it appears that any drug which can prevent development of those forms which produce auto-infection will, in the absence of reinfection from outside, cause an infection to die out automatically within a few weeks.

ELECTROCARDIOGRAMS OF THE DYING HEART

A CASE is reported by Hamilton and Robertson [4] in which electrocardiograms were obtained during a fatal heart attack.

The patient, a man of 49, said that for two years he had had dyspnœa on exertion and attacks of epigastric distress with flatulence. Though not typical of effort angina, these may yet have been related to relative ischæmia of the heart. The only definite objective sign of cardiovascular disease was seen in the electrocardiogram, which showed delayed intraventricular conduction and T wave changes. While at rest in hospital the patient had an attack of epigastric burning and fullness, and the tracing which was immediately taken showed auricular fibrillation, with a slow ventricular rate and ventricular extrasystoles. Nitroglycerin was given, but the distress increased in severity and there was precordial pain with radiation down the left arm. After a few minutes pain disappeared, the tracing then showing auricular fibrillation, a slow ventricular rate, and increased inversion of the T wave. A few minutes later, however, sudden severe pain returned and the patient quickly became unconscious, the tracing showing ventricular fibrillation. This last was recorded for some nine minutes, the waves gradually diminishing in size till they finally ceased. An autopsy showed only slight hypertrophy of the heart, this affecting the right ventricle. There was moderate atheroma of both coronary arteries, but no recent infarction was discovered either on macroscopic or microscopic examination, nor was there any recent clot in a coronary artery.

Hamilton and Robertson describe the attack as one of angina pectoris; and while the patient with Heberden's angina is certainly exposed to the risk of sudden death, we now know that what used to be called a fatal attack of angina pectoris is usually due to thrombosis of the coronary artery. The patient with effort angina is also liable to die suddenly apart from any painful attack, and when this happens death is presumed to be due to the inception of ventricular fibrillation in a muscle whose function is altered by ischæmia. Death in an attack of simple angina without coronary occlusion is, however, probably quite rare. In the case recorded recent coronary occlusion was excluded at autopsy, although the clinical observations were in keeping with such a diagnosis. Auricular fibrillation is not very uncommon during the acute phase of coronary occlusion, but it does not seem to occur in simple angina, and in showing this arrhythmia the case described was certainly exceptional. The statement made in the report that "the diagnosis of angina pectoris was confirmed at autopsy" must be criticised. Angina pectoris is a pain, and not a morbid anatomical condition.

[3] Jour. Amer. Med. Assoc., 1932, xcviii., 2276.
[4] Canad. Med. Assoc. Jour., August, 1933, p. 122.

THE ROYAL SOCIETY

ONE of the two Royal medals conferred this year by the president and council of the Royal Society has been awarded to Dr. Patrick Playfair Laidlaw, of the National Institute for Medical Research. Dr. Laidlaw, who was elected an F.R.S. in 1927, is pathologist on the staff of the Medical Research Council, having formerly held appointments in the departments of physiology and pathology at Guy's Hospital. He has made a special study of virus diseases and was successful, in conjunction with Mr. G. W. Dunkin, in discovering a method of preventing distemper in dogs. More recently he has attacked the problem of influenza, and last July he and his collaborators recorded in our columns important observations on the transmission of this disease to ferrets. The Copley medal has been awarded to Prof. Theobald Smith, of Princeton, New Jersey, who was director of the department of animal pathology of the Rockefeller Institute of Medical Research from 1914 to 1929, and is a foreign member of the Royal Society. From the time of his first demonstration, in 1893, that red-water fever in cattle can be transmitted by ticks, Dr. Theobald Smith has made a series of important contributions to parasitology and medicine. He was the first investigator to transfer the insect transmission theory of protozoal disease from the region of hypothesis to the region of established fact.

The following names have been put forward for election as officers of the Royal Society at the anniversary meeting to be held on Nov. 30th: president, Sir Gowland Hopkins, F.R.C.P.; secretaries, Sir Henry Dale, M.D., and Sir Frank Smith; foreign secretary, Lord Rayleigh. The 16 other members of the council include Dr. E. J. Butler, Prof. T. R. Elliott, Prof. A. V. Hill, Prof. J. C. McLennan, Dr. F. H. A. Marshall, Sir Charles Martin, and Prof. E. Mellanby.

THE next session of the General Medical Council will commence at 2 P.M., on Tuesday, Nov. 28th, when the President, Sir Norman Walker, will take the chair and give an address.

NURSES' HOSTEL AT PUTNEY.—Prince Arthur of Connaught last week laid the foundation-stone of a new nurses' hostel which is being built in the grounds of Putney General Hospital. When the building is completed the top floor of the hospital, now occupied by the nurses, will be used for paying patients. The hostel, which will contain 40 bedrooms, will range with the main building in architectural character. The hospital serves a population of 100,000, and it was stated at the ceremony that its 53 beds are inadequate to the demand upon them.

THE PREVENTIVE ASPECTS OF MEDICINE

A Series of Lectures in progress during the Winter Session at King's College Hospital Medical School

V.—PREVENTION OF DISEASE IN INFANCY

I SUPPOSE that preventive medicine like most other things should begin at the beginning. I would have you realise that life does not begin at birth, but before birth, and if preventive medicine has its application to all periods of life—as we are coming to believe—then it behoves us to consider in what sense it is applicable to life before birth, and the more so as it is clear that, in some very important respects, well-being after birth is conditioned by what has happened during intra-uterine life. I shall deal therefore first with the antenatal aspect of preventive medicine in relation to infancy.

Antenatal

We talk about "quickening" in the fourth month of pregnancy, but from the biological standpoint the vital processes begin from the moment when the multiplication of cells starts in the ovum. There is evidence, experimental and clinical, that the vital processes even at this early period can be influenced by factors which are to some extent under our control.

For at least a century observers have been making investigations into the effects of various agents, environmental, chemical, and physical, in the production of abnormalities in the new-born animal. They have used embryos of various animals, especially the chicken, for their experiments, and have accumulated a certain amount of evidence that alterations of development can be produced by such agents. The practical interest of these experiments lies in their bearing upon the antenatal development of the infant. How far do factors affecting the mother during pregnancy affect the infant before birth and after birth? Certainly if any steps can be taken to enable the new-born child to start out upon the adventure of life with a well-built body and a vigorous constitution, and particularly to prevent the handicap of deformity and the tragedy of a damaged or ill-developed brain, then surely these should be known. Perhaps even this way of stating the problem hardly covers the whole possibilities, for it rather implies that the antenatal development of the infant is related only to maternal factors, whereas experimental observation more than suggests that the paternal element also may have some influence upon the development of the offspring. As a clinical fact this is obvious enough in the inheritance of physical peculiarities from the father, as well as morbid tendencies or conditions transmitted only from the father. Experimentally it has been demonstrated in animals in regard to alcohol.

It has been shown that alcohol injected into the albumin of an egg increases greatly the chance of malformation in the developing chick. This might indicate only that alcoholism in a mother might favour abnormalities of development in the unborn child; but it has also been shown that when a male animal is heavily dosed with alcohol before mating, then, although the female has received no alcohol, the offspring is liable, beyond the average, to show deformity or to be unhealthy and short-lived.

I think one must be very cautious in drawing inferences from animal experiments as to what obtains in the human, but clinical observation does, I think, suggest that where, before the conception of the child, there has been recent alcoholism in either parent, there is risk of faulty development of the unborn child, and it seems likely, in view of these experiments, that frequent indulgence in alcoholic drinks, without actual drunkenness, during pregnancy, may be prejudicial to the child. I draw attention to this possibility particularly because, although proof is impossible, I have thought—as a result of my own observations, as others have from theirs—that sometimes mental deficiency, that most deplorable of developmental failures, occurred in the child through alcoholic indulgence in one parent or in both.

PARENTAL SYPHILIS

A more demonstrable and much more easily preventable cause of disease in the child, both before and after birth, is syphilis in the mother. Here, at any rate, we can demonstrate the presence of the disease in the parent and the preventive value of timely treatment of the mother in securing a normal child is indisputable. There is probably no stage of intra-uterine life at which parental syphilis may not be disastrous to the coming child. It is certain that in the later months of pregnancy actual invasion of the *Spirochæta pallida* into the developing organs of the fœtus, especially the liver, may occur and cause gross changes which result in death, either before or soon after birth. Moreover, the syphilised infant, even if born alive, is apt to be a feeble puny infant with little chance of survival, even if treated for the disease directly after birth. In the commoner cases, where the symptoms only appear in the child a few weeks after birth, the effects are serious enough and may result in a permanently damaged life. Apart, however, from frank symptoms of syphilis in the infant, there can be little doubt that results not less serious may be due to this cause acting very early in intra-uterine life, and amongst these results none is more disastrous for the child nor more expensive for the nation than mental deficiency.

My own figures showed, amongst children with congenital syphilis, 7 per cent. with mental deficiency (in some of these the mental affection began after birth), a proportion 20 times greater than that in the population in general (0·3 to 0·4 per cent.).

Some striking figures were published in America, where it was found that amongst families in which there was no child with congenital syphilis there were 4 per cent. of families with a mentally defective child, whereas amongst those in which there was at least one child with congenital syphilis, 20 per cent. of the families included a mentally deficient child.

These facts emphasise the extreme importance of preventive measures in regard to syphilis as affecting the infant before and after birth.

The detection and treatment of syphilis in the pregnant woman, and still better in the woman who is not yet pregnant, are preventive measures of the first rank. Clinics for venereal diseases and antenatal clinics can do invaluable work in this respect. If adequate treatment is given to the mother as early as the third or fourth month of pregnancy the infant is likely to be born free from the disease; but, inasmuch as most of the organs are already advancing in development before the third month, it is evident that if, as seems probable, syphilis can produce abnormalities of development before that time, the infant is more thoroughly safeguarded the earlier treatment of the mother is begun. I shall refer later to the importance of the detection of vaginal discharge and gonorrhœa in the expectant mother.

DETECTION OF ABNORMALITIES OF PREGNANCY

The value of the antenatal clinic is considerable in another direction. The detection of abnormal pregnancies and of abnormal positions of the fœtus is the first step towards corrective treatment which may facilitate labour. Difficult labour is undoubtedly responsible in some cases for serious cerebral conditions, shown perhaps in convulsions soon after birth, sometimes in irrevocable damage to the intellect, and sometimes in spastic paralysis, and the prevention of these evils is no small matter.

DIET OF EXPECTANT MOTHER

In yet another way the antenatal clinic should be of value to the as-yet-unborn infant—viz., in ensuring, as far as practicable, suitable feeding of the prospective mother. There is some evidence that the diet during pregnancy has an influence upon the development of the unborn child. This sounds so obvious as hardly to be worth stating, but in actual experience it is not nearly so evident as might be expected. It is one of the paradoxes of human reproduction that an underfed, almost half-starved mother may give birth to a well-nourished infant; the infant seems to have preference in Nature's scheme; if intake is not sufficient for both, the fœtus draws upon the mother's capital; Nature will not readily suffer the unborn child to go short.

Experiments on rats have shown that by purely dietetic treatment of the pregnant rat it is possible to influence the average weight of the rats in a litter and not only their weight but their prospect of survival. The increased chance of survival depended in part, but not altogether, upon increased power of lactation in the mothers fed upon a certain diet during pregnancy; egg, particularly, was found to promote in rats the ability to suckle.

No evidence has yet been brought forward, as far as I know, that any particular diet in pregnancy directly influences the human mother's power of lactation; if it were so, it would be a very important means of preventing disease and death in infancy.

But apart from this, if diet in pregnancy has any influence in promoting the nutrition and development of the fœtus, it is of practical importance, for there can be no doubt that the infant who comes into the world vigorous, well-developed, and well-nourished stands a better chance of survival than an underweight weakling, and can face with less risk the ills that infant flesh is heir to. In the most general way it can safely be assumed that liberal and wholesome feeding of the mother during pregnancy must favour the production of a normal and well-developed infant.

How far any strict balance of the various constituents of the mother's food during pregnancy is necessary for the normal development of the child is at present largely a matter of theory and speculation. Experimental observations have been made upon the retention of calcium and phosphorus by the mother, which must, of course, be of importance, especially during the last two to three months of intra-uterine life, when calcification is most active in the fœtus. But no dietetic rules can be laid down with any certainty. Probably milk, eggs, and butter are particularly of value. There is some evidence that administration of cod-liver oil during pregnancy favours the retention of calcium, and so may, to that extent, assist the production of a well-developed infant.

This raises the question how far vitamins play any part in the prevention of those ills which are of antenatal origin. Statements have been made that vitamin A is essential to the growth of the fœtus; that deficiency of vitamin B in the mother's diet during pregnancy leads to debility in the new-born infant; that vitamin D is so important during the development of the fœtus that the expectant mother should be irradiated two or three times a week!

There is no doubt that vitamin D plays an important part in calcification; it is equally certain that calcification is very active during the last three months of pregnancy. The calcification of the primary teeth begins about the fourth month of pregnancy, and before the end of pregnancy some of the permanent teeth are already becoming calcified. It is therefore at least possible that by ensuring sufficient vitamin D in the diet of the expectant mother we may promote good development, and, in particular, prevent hypoplasia of enamel, not only in the primary teeth but also in some of the permanent teeth of the coming child, and may thus to some extent reduce the liability to dental caries in early life. I said deliberately "sufficient" vitamin D. It is difficult to say what is sufficiency; but I think that clinical evidence goes to show that the amount of any vitamin requisite to prevent symptoms of vitaminosis in respect of any particular vitamin is extremely small, and that any advantage from flooding the body with vitamins, intensive administration, so to speak, of vitamins, is quite unproven. After reading some of the present-day writings on the subject one can hardly believe that there were babies, and even healthy babies, born in early Victorian times, when people were so benighted that expectant mothers lived on their ordinary diet, without addition of any special vitamin preparation or even weekly doses of ultra-violet rays!

Vitamins are, of course, a necessity at all times of life, possibly even a special necessity during pregnancy, but in this country the ordinary diet, unless possibly under very exceptional conditions, contains all the vitamins that are required; the idea of meritorious "works of supererogation," so to speak, in giving extra supplies of vitamin, rests, to say the least, on no secure foundation.

If the expectant mother can obtain a sufficient quantity of milk, potato, butter, or one of the better-class margarines, and still more if she can have eggs, as part of her diet, she will have all that is needful, so far as vitamins are concerned. Where eggs are not obtainable fresh herring, perhaps even kippered herring, may help to make up for any deficiency of vitamins A and D in the diet. Some have recommended that for this purpose she should take some preparation of cod-liver oil, but there must be many women to whom this would be nauseous.

There is one further point in connexion with the mother which needs mention in guarding against risks to infant life. It has seemed to me, as it has to others, that in some cases the use of "twilight sleep" during labour is responsible for temporary feebleness of the vital processes in the new-born infant, and sometimes to a degree which endangers life.

Postnatal

In the new-born child amongst the most important preventive measures are those taken to avoid

OPHTHALMIA NEONATORUM

About a third of the children who are blind are so as the result of ophthalmia neonatorum. After careful cleansing of the eyelids with warm water or a weak boric lotion, one drop of a 1 per cent. solution of silver nitrate, or of 10 per cent. argyrol, is dropped into each eye. In some maternity institutions this is done as a routine practice, and it is claimed that the occurrence of ophthalmia in the new-born has been diminished greatly thereby. Certainly where there has been any vaginal discharge in the mother during pregnancy, and a fortiori if she is known to have had gonorrhœa, this precaution should never

be omitted. Better still is the prevention of the infection by treatment of discharge in the pregnant woman; in this way antenatal clinics can render invaluable service.

DIET IN INFANCY

Throughout infancy the prevention of disease turns largely—perhaps more largely than at any other period of life—upon feeding. There can be no doubt that one important factor in the large reduction of infant mortality which has taken place in recent years has been the diffusion of knowledge on the subject of infant care, especially infant feeding, by the infant welfare movement; the establishment of infant welfare centres and the dissemination of organised instruction of mothers by trained home-visitors and others, have done much to prevent those gastro-intestinal and other disorders which arise from faulty feeding and contribute so largely to infant mortality.

There is no single preventive measure which is so valuable in infancy as breast-feeding. This remains true in spite of the fact that the risks of artificial feeding have undoubtedly been diminished by the more intelligent methods adopted nowadays. Breast milk not only supplies all that is needful for the infant during the first eight or nine months of life, but supplies it in the form most readily utilised by the infant. If this ideal of eight or nine months suckling is impracticable, as it is for many women, any less time is of real value; even a few weeks of breast-feeding seems to have a definite and specific value in, so to speak, establishing the new-born infant, perhaps even in conferring upon it some degree of immunity against infection.

Against all the gastro-intestinal disorders which beset infancy, against rickets and infantile scurvy, against those failures of nutrition which so often make artificial feeding an anxiety, breast-feeding is the surest preventive; and yet nowadays one finds orange juice, cod-liver oil, and sometimes even iron preparations being advised as a routine for infants who are at the breast, as if Nature were in her dotage and woman no longer capable of rearing healthy offspring by Nature's method.

If only these well-meaning theorists would leave Nature's food alone, they would find that, at any rate under the conditions of feeding of the mothers which prevail in this country, there is no likelihood of the breast-fed infant lacking any of those particular essentials which are supposed to be supplied by the additions which I have mentioned. Preventive measures of this sort, where none are needed, are, as I have many times seen, simply mischievous, resulting, as they are apt to do, in disturbance of digestion.

SCURVY

Very different is the case of artificial feeding. Here the question of vitamin sufficiency becomes a point of importance in the prevention of disease, and in these days when dried milk so largely replaces fresh milk, and when "fresh milk" so often means pasteurised or boiled milk, it is a wise precaution to give vitamin C in the form of fruit juice or tomato juice when the infant is about 3 months old; nowadays it is often given earlier, but as it certainly causes digestive disturbance in some infants, it seems a pity to give it earlier than it is needed. Amongst a very large number of infants fed on all sorts of infant foods, in days when it was not customary to give fruit juice at all, I have never seen any indication of vitamin-C deficiency under the age of 5 months, and I may add here that I have not seen a single instance of such an occurrence in a baby whilst it was breast-fed.* The amount of fruit juice which is required for the prevention of vitamin-C deficiency, as shown in infantile scurvy, varies according to the character of the artificial food which is being given. With milk which is only pasteurised, or heated till bubbles just begin to rise, 4 teaspoonfuls of orange or grape juice daily will be enough, but with more scorbutic preparations, such as the various advertised "infant foods," and any food in which the milk is predigested, quite 8 teaspoonfuls of orange juice or 12 of grape juice (which is not quite so potent as orange juice) may be required daily. This is much less likely to disturb digestion if it is given divided into three or four small doses than if given in a single dose.

When an infant has reached the age at which potato can form a part of the regular diet, generally about 9 or 10 months, the need for fruit juice as a purveyor of vitamin C no longer exists; potato is so potent in vitamin C that although cooked and given in comparatively small quantities, it cures infantile scurvy very rapidly.

This is not to say that raw fruit has not its own value quite apart from any vitamin content; fruit and vegetable not only have some laxative value, but also supply various salts and moreover are pleasant variants in the diet. But raw fruit is a common cause of digestive troubles in young children—raw vegetables, recommended by some theorists, even more so—and one often finds that although a child is already taking potato as part of his regular diet, he is being plied in addition with fruit or fruit juice under the mistaken idea that this is needful to prevent deficiency of vitamin C, and as a consequence is suffering with chronic intestinal indigestion.

RICKETS

Amongst the preventable diseases of infancy rickets was formerly one of the least often prevented. In London it is now very much less common than it was 40 years ago, thanks chiefly to the great improvement in the feeding of infants; and no doubt in quite recent times the extensive use of cod-liver oil as part of the daily régime (it is an ingredient in some of the artificial "cream" used in infant feeding) has still further diminished the occurrence of rickets.

It would be a mistake to suppose that in the absence of such addition of vitamin D as is afforded by cod-liver oil, hand-feeding necessarily entails any considerable risk of rickets. Quite apart from theoretical considerations of the varying quantities of vitamin D present in cow's milk, the fact remains that the vast majority of infants fed upon cow's milk diluted as little as will make it digestible for the particular infant do not get rickets. In days before vitamins were heard of, and when the feeding of infants amongst the poorer class was haphazard and unintelligent, 30–40 per cent. of children under the age of 3 years attending hospital were suffering with frank rickets, but in that same period, amongst the better-off class, where hand-feeding was common enough but more carefully regulated, rickets was quite uncommon, though no one thought of giving cod-liver oil as a preventive to a healthy child.

Recently the potency of halibut-liver oil has led to its use as an alternative to cod-liver oil. Some years ago, at the suggestion of Dr. S. S. Zilva, I experimented with the oil of the liver of the coal-fish and found that this also was

* Perhaps I ought to qualify this by saying that many years ago a surgical colleague showed me as a unique curiosity some swelling of the gum in a breast-fed infant (without other symptoms of scurvy). He thought this was an instance of scurvy occurring in a suckling, but it seemed to me at the time inconclusive.

very potent in the cure of rickets as proved by X ray investigations. I do not think that—apart from possible reduction in the dose of nastiness—there is any advantage in the use of a preparation containing a particularly large amount of vitamin D. Clinical evidence seems to me to indicate with regard to vitamins in general that enough is as good as a feast, there is nothing gained by excess, and if we may judge from experiment upon animals, there may even be harmful results from excess. Probably the plain cod-liver oil with its contribution of vitamins A and D is at present the most practicable and useful preventive, where any is needed, against rickets.

There are, however, infants who have difficulty in digesting fats, and for them, one of the preparations in which vitamin D is present without fat or with very little fat may be more suitable.

After the period of breast-feeding there are no foods so valuable in the first two years of life—the period of infancy proper—for the prevention of rickets as milk, butter or good margarine, and eggs, which supply vitamins A, B, and D, and if the milk is fresh, C also.

Of all the vitamins the one which is least likely to be deficient in the diet of any child in this country is vitamin B, which is present so widely in foods of all sorts and is so little likely to be destroyed by any ordinary cooking procedure that the infant can hardly escape getting a sufficiency. It is pitiable to see parents who can ill-afford it spending money upon preparations advertised to supply vitamin B, under the mistaken impression that they are a valuable addition to the diet and prevent a lack which might be serious to the child.

DENTAL CARIES

The prevention of dental caries is one of the possibilities that have emerged from experimental work upon the effects of diet. An adequate supply of vitamin D seems not only to have some preventive value, but when there has been deficiency of this vitamin its administration in sufficient quantity may even arrest caries while it is still in an early stage. The importance of cleaning the teeth, especially at night, to clear away the debris of food which collects about the neck of the tooth, can hardly be doubted; and the tendency of some foods, for instance, biscuits and chocolates, to collect thus has been thought to make them specially apt to promote caries, unless the teeth are cleaned sufficiently often and regularly. From the time when an infant has six or eight teeth, which will usually be about the end of the first year, they should be cleaned with a soft brush daily, and I know nothing better for this purpose than one of the liquid preparations of magnesia. Food which encourages mastication may be, in theory, of value as tending to prevent stagnation of food between and about the teeth, but common sense is needed in judging how far this is practicable. I have many times seen children wasting and evidently suffering with chronic intestinal indigestion from the constant taking of coarse, rough, or hard food, given deliberately with the idea of encouraging mastication. Children are apt to be inveterate food bolters, and if they can be taught to masticate thoroughly, so much the better, but if they cannot then their food should certainly not be such as to require a large amount of mastication.

INFECTIOUS DISEASES

Passing now from dietetic preventives, I want to say a word about certain inoculations which are used in infancy.

Vaccination against *small-pox* is so general and of such indisputable protective value that I need only mention it as a measure which should be adopted for every infant unless there is some special reason to the contrary. In maternity institutions it is often done in the first week after birth, but as some infants, especially if they cannot be breast-fed, do not start gaining weight satisfactorily at first, there are advantages in waiting until the baby is about 2 months old; if by that time the infant is making good progress, the transient disturbance of vaccination will not matter.

Inoculation against *tuberculosis* is a very different matter. Recently on the Continent attempts have been made to safeguard the infant who is born into a family where there is already tuberculosis by oral administration of an attenuated tubercle bacillus, the preparation known as B C G (Bacillus Calmette-Guérin). This is given in three doses during the first ten days of life. It is supposed to confer immunity for about two years, and clearly would be of great value if it were a safe procedure; for the maximum mortality from most forms of tuberculosis in childhood is during the second year. Unfortunately, however, there seems to be very real risk of producing a serious infection with tuberculosis by this method so that it has not found favour in this country.

The prevention of tuberculosis in infancy resolves itself at present into two measures: the avoidance of association with persons suffering from active tuberculosis, and prevention of infection by food, especially by milk and cream. Pasteurising, scalding, or boiling all the milk which the child takes is no safeguard if in the meantime the child is having fresh cream which is at least as likely, some think more likely, to contain tubercle bacillus. Butter also, unless made from pasteurised milk, is a possible source of infection, though probably much less likely than milk or cream, so that the small risk from it is usually ignored. If it were compulsory that English butter, like Danish imported butter, should be made from pasteurised milk, this risk also might be eliminated. The whole question of the sale of unpasteurised milk and cream is a very serious one with regard to the prevention of tuberculosis, especially in infancy and childhood. It is not such a simple matter as it sounds. Apart from economic difficulties, even if compulsory pasteurisation were introduced, it is by no means certain how this would affect the occurrence of tuberculosis. My own belief is that in view of the large numbers of cases in which tuberculosis in early childhood is due to milk infection, such a measure would reduce the incidence of tuberculosis at that age considerably, but it is also conceivable that more or less immunity from tubercle is gradually acquired by many children as a result of ingestion of very small quantities of tubercle bacilli, and that if these tubercle bacilli were entirely excluded from the food for the first few years of life, the child would later fall an easy victim to the disease on any exposure to tuberculous infection. I know of no proof that this is so, but I have seen a few instances in which the very quick infection of the child after cessation of the precautionary boiling of all milk suggested such a lack of immunity.

INFANTILE DIARRHŒA

One of the chief causes of infant mortality is that group of infectious disorders which are classed together as infantile diarrhœa, gastro-enteritis, or ileocolitis. When I began work in some minor post at a children's hospital 40 years ago, the wards from July to September presented a veritable shambles, a massacre of the innocents. The infants came in dying, or to die, with summer diarrhœa, and if they had not already

contracted it before admission, they soon added it to the illness for which they had been admitted.

The preventability of this infectious diarrhœa in infancy is suggested by the reduction which has taken place in the annual mortality from this cause. In the year I mentioned, 1893, there were in England and Wales 20,722 deaths from diarrhœal affections in the first year of life, whereas in 1931 (the latest available figures) there were in England and Wales 3284 deaths from this cause in the first year of life. The years I have mentioned are not exceptional. Statistics, however, are fallacious, for this apparently enormous reduction must be correlated with the number of infants born; in 1893 there were 914,542 live births in England and Wales, whereas in 1931 the births had fallen to 632,081; so that a reduction of about one-third in the number of deaths from diarrhœa would not prove any diminution of the incidence of fatal diarrhœa.

The reduction, however, is much more than one-third, and I think we are justified in the belief that preventive methods have reduced very considerably the incidence of fatal diarrhœa in infancy.

Cleanliness in the handling of milk has no doubt been one factor in this improvement. From the cowshed to the nursery methods have improved; the risk of contamination by dust, by dirt, by flies, is now very generally recognised and to some extent prevented. The bottling of milk, and, still more recently, its sale in cartons, have helped towards cleanliness. Probably the extensive pasteurisation of milk, and still more the widespread use of dried milk, have contributed largely to the prevention of these gastro-intestinal infections in infancy, and it is by encouraging these safeguards against bacterial infection of milk that we may hope to reduce still further the mortality from diarrhœa in infancy.

Valuable as such precautions are, they are none of them such a safeguard to the infant against fatal diarrhœa as is breast-feeding; my own figures, published many years ago, showed that 96 per cent. of the fatal cases of diarrhœa up to the age of 9 months were in infants partially or entirely hand-fed.

FRESH AIR AND SUNLIGHT

In the prevention of infections, as in the prevention of some of the other disorders of infancy, there are two factors of general application to which I have not alluded hitherto, viz., fresh air and sunlight. The value of these has been emphasised in recent years to the great advantage of all periods of childhood. The difference between the pale infant who has his day sleep cooped up in a stuffy room and the rosy healthy infant who sleeps out in his pram in the open air is often sufficiently obvious. Open windows and sunshine profit an infant as they do an older child, probably making him actually more resistant to infection, but it is necessary to mention that there is also a time when warmth is more important even than fresh air. An infant who is feeble, whether through illness or from congenital debility, especially one that is premature, may have his chance of survival jeopardised by the fresh air enthusiast who forgets that the infant can ill spare the energy used up in maintaining his body-heat, and that to increase the demand upon his energy by surrounding the infant with cold air is sometimes actually to endanger his life.

EFFECTIVENESS OF PREVENTIVE MEASURES

The rôle of prevention in the safeguarding of health in infancy is clearly shown by the fall in infant mortality which has taken place in the last 40 years; in 1893 the infant mortality-rate (for infants under 1 year of age) in England and Wales was 159 per 1000, in 1931 it was 66 per 1000. The improvement began about the beginning of the century.

Whatever may be the particular factor which has played the chief part in this enormous saving of infant life, there can be no doubt that it is preventive. Curative measures have improved in this period and have certainly contributed their share to the saving of life, but only in very small proportion compared to the large contribution by preventive measures. In a general way the dissemination of knowledge of the elementary facts of the hygiene of infancy has probably done most to lower the infant mortality-rate and at the same time to improve the standard of health in infancy and thereby to lay the foundation for a healthier manhood and womanhood.

G. F. STILL, M.A., M.D., LL.D.
Consulting Physician for Diseases of Children, King's College Hospital; Consulting Physician, Hospital for Sick Children, Great Ormond-street.

POST-GRADUATE LECTURES

DURING the past five weeks we have published parts or summaries of 15 lectures given at the autumn post-graduate courses of London medical schools. The series ends this week with those of Dr. Riddoch and Mr. Dix, both of them delivered at the London Hospital.

HEADACHE

(DR. GEORGE RIDDOCH)

FOR the investigation of headache a plan is necessary. Inquiry should be made into: (1) the quality of the pain; (2) its focus and direction of spread; (3) its continuity or intermittency; (4) its time of onset; (5) the conditions which precipitate it, aggravate it, or give relief; and (6) other symptoms associated with it, such as cutaneous tenderness, giddiness, nausea, or vomiting. On the information thus obtained an attempt can be made to classify headaches, if we realise that from incomplete knowledge the classification will be imperfect.

I propose on this occasion to pay special attention to two groups of headaches which seem to be due to gross variations in intracranial pressure, and which occur as symptoms of widely differing morbid states. They are met with every day, are often severe, and are frequently amenable to simple methods of treatment.

In the first place, two separate kinds of headaches from this cause are to be distinguished—those in which the intracranial pressure is excessively high, and those in which it is excessively low.

INTRACRANIAL HYPERTENSION

The high pressure headache is usually described as an ache with superadded throbs or shoots of pain, which are provoked by coughing, sneezing, straining, stooping, sudden exertion, or excitement, in fact anything that raises pressure within the skull. It may be frontal, temporal, or occipital, but tends to be general when severe. For long it is paroxysmal, and it may continue to be so if the underlying pathological process is not progressive. The posture of the patient influences its occurrence to a striking extent. Thus, after any considerable period in the recumbent position, headache almost invariably develops, and this is the explanation of the "morning headache" of cerebral tumour. During sleep the blood pressure falls by 15–30 mm. Hg, which compensates

for the effect of gravity. Towards morning, however, sleep becomes lighter and it rises to the diurnal level, with the result that pressure within the skull increases, and, if it is abnormally high, the headache comes on. Such headaches are often accompanied by giddiness and vomiting, with or without nausea.

Headaches which more or less conform to this type are common to diverse pathological states—for example, meningitis; following concussion, epileptic fits, cerebral hæmorrhage, thrombosis, or embolism; associated with arterial hypertension, emphysema with bronchitis and heart disease, if there is cyanosis after a general anæsthetic or alcoholic intoxication; and in anæmia, migraine, and so on. The common pathological factor is raised intracranial pressure, the causes of which may be :—

(1) *Obstruction of the circulation of cerebro-spinal fluid.*—If there is blockage of the cerebro-spinal fluid circulation—e.g., at the foramen of Munro or the aqueduct of Sylvius—local or general internal hydrocephalus develops. Tumours and meningitis are the common causes of hydrocephalus from interruption of outflow. There is also good reason for believing that as the result of adhesions due to bleeding from trauma, or to meningitis, the cerebro-spinal fluid circulation may be impaired at the opening in the tentorium cerebelli in which the mid-brain lies. External hydrocephalus in the posterior fossa, as well as internal hydrocephalus, would then result.

(2) *Venous hypertension.*—Obstruction of venous outflow from the skull, as in emphysema, heart failure, and more temporarily in an epileptic convulsion or asthmatic attack, gives rise to intracranial hypertension in two ways—by impeding the absorption of cerebro-spinal fluid into the sinuses, since the pressure within the sinuses is increased; and by increasing the production of cerebro-spinal fluid.

(3) *Arterial hypertension.*—The mechanism by which general arterial hypertension gives rise to headache is perhaps not simple, for, in addition to raising the average pressure within the skull by increase of blood volume, it may lead to excessive production of cerebro-spinal fluid. At all events, in cases of high blood pressure morning headache is common, and hurrying, stooping, coughing, and straining provoke headache of the hypertension type.

(4) *Cerebral œdema.*—Effusion of fluid into cerebral tissues follows obstruction of venous outflow—e.g., in emphysema or heart failure. Such abnormal states as an epileptic fit, an asthmatic attack, or a bout of severe coughing, which cause temporary congestion, and the transient anæmia of concussion and the paralytic phase of migraine (hemianopia, aphasia, hemianæsthesia), which are presumably followed by vascular engorgement with œdema, are causes of headache of the hypertension type. Further, the "intoxication" headaches from alcohol, chloroform, ether, and uræmia are hypothetically due to cerebral œdema from either increased permeability of the capillaries or increased extent of the dilated capillary field.

Alleviation of pain without immediate resort to analgesic remedies ought to be the basis of rational symptomatic treatment. In the case of headache of the hypertension type this principle, in essence, will be successfully applied if pain is relieved by reducing the pressure within the skull to safe limits. This can be done in various ways.

Regulation of posture.—We have seen that the horizontal position, from the influence of gravity, tends to provoke headaches of hypertension type when intracranial pressure is already elevated. As a means of relief from the morning headache the patient should, therefore, be instructed to lie in bed with his head and shoulders well raised with pillows. If he is ill and tends to slip down in bed, he should be kept in position by a sling under his buttocks and attached to the upper bed-posts, or by a tilt in the middle of the bed as is used in abdominal cases. Ambulant patients should be warned against stooping.

Dehydration.—Abstraction of fluid from the body and so from the cranium is a method for giving relief from hypertension headaches that ought to be more commonly used than it is. The method is an old one, and, so far as I know, was first advocated by my old teacher, Prof. Matthew Hay, who advised the administration of a dose of Epsom salts in the morning before breakfast sufficient to give a fluid motion. Many old men who are attached to good living, and whose blood pressure is higher than it ought to be, gain comfort from it, as well as many young men who do not keep within the limits of their tolerance for alcohol and food. At all events, salts by mouth in sufficient dosage is most useful as a means of dispelling the milder headaches of this class. If taken early enough in the stage of premonitory symptoms it frequently checks the onset of the headache of migraine.

In the case of headache from intracranial tumour or cerebral contusion the rectal method of administration of hypertonic saline is more beneficial. It should be given as a 50 per cent. solution—for example, 3 oz. of magnesium sulphate in 6 oz. of water—and injected slowly through a catheter and retained for 20 or 30 minutes, once or twice a day. Sometimes a solution of this strength is irritating to the rectal mucous membrane, and if so, 8 oz. of a 25 per cent. solution can be used instead. More rapid results are obtained by giving hypertonic saline intravenously. For this purpose 70–100 c.cm. of a 15 per cent. sterile solution of sodium chloride in distilled water or 35–50 c.cm. of a 30 per cent. solution is commonly employed. Alternatively, 80 c.cm. of a 50 per cent. solution of glucose in normal saline can be given, and it has the advantages that its effects are more sustained and it has some nutritive value. Care, however, must be taken that the glucose is pure, and has been kept dry and free from mould. Magnesium sulphate, because of the risk of anæsthesia and respiratory paralysis, should not be given intravenously.

When hypertonic salines are being employed for the purpose of dehydration, the intake of fluids should, of course, be restricted.

Lumbar puncture.—Reduction of pressure within the skull with resulting relief from hypertension headache can be attained more directly by lumbar puncture, but the applicability of this method is more restricted. It should rarely be used in cases of cerebral tumour, and never when tumour of the posterior fossa is suspected because of the risk of bulbar compression from herniation of the cerebellar tonsils through the foramen magnum. Nor is it a convenient therapeutic agent in arterial hypertension and chronic emphysema. It is, however, of considerable value in cases of meningitis and uræmia.

Venesection has largely fallen into disfavour, partly as a reaction from its extensive and frequently indefensible practice by our forebears; but it still has its uses, especially in venous congestion from chronic emphysema and heart failure. In addition it ought, I feel, to be advocated more often than it is in chronic nephritis with high diastolic pressure, especially in thin patients. The removal of 8–10 oz. of blood every six or eight weeks gives considerable relief from headache when other measures fail.

INTRACRANIAL HYPOTENSION

The group of headaches due to lowered intracranial pressure is perhaps smaller. But it is curious that very little attention has been paid to them, for they are not uncommon, and are often amenable to rational methods of treatment.

As an example let us take the headache that so frequently follows lumbar puncture. If the patient

is allowed to get up soon after the puncture has been performed, within an hour or so he may begin to complain of an ache, which increases in intensity until, if he persists in the upright position, it becomes intolerable. It commonly commences in the front, top, or back of his head, but tends to become general, and is frequently associated with a sensation of pressure and tightness. Prominent features of the headache are its continuity so long as the patient sits up, and its relief when he lies down. It is the antithesis of the hypertension headache.

The lumbar puncture headache is probably the result of drainage of cerebro-spinal fluid through the opening in the theca made by the lumbar puncture needle, and is the most pronounced example of headache of the hypotension variety. But many headaches met with in practice, from their clinical features, appear to belong to this group. For example, the headaches associated with abnormally low blood pressure, as in Addison's disease, decrescent arteriosclerosis, excessive vomiting, diarrhœa, or bleeding, as well as some cases of neurasthenia and cerebral contusion. The mechanism of production of the pain is obscure, but it may be due to traction on the dura and its invaginations, or it may be vascular in origin.

Symptomatic treatment.—The underlying principle of treatment is to raise the pressure within the skull to normal limits. With regard to lumbar puncture headaches, their prevention is largely in our own hands. A needle of small diameter, which ought to be sharpened for each operation, should be employed. If possible, the theca should be punctured once only (chiefly but not invariably a matter of practice and care), and after the operation the patient should be made to lie flat for at least 12 hours. If these precautions were taken lumbar puncture headaches would be less common.

For the headaches associated with arterial hypotension and dehydration from repeated vomiting, diarrhœa, and bleeding, the administration of hypotonic fluids, such as ordinary drinking water by mouth or distilled water intravenously or per rectum, is reasonable. Pituitrin and other peripheral vasoconstrictors can, if necessary, be employed in special circumstances, but they can give only temporary relief. The recumbent posture, however, is often very helpful. Patients should sleep with the head low.

A full stimulating diet, moderate exercise, and general massage are beneficial in those cases in which headaches of this kind are associated with low blood pressure in neurasthenic subjects.

PROSTATIC OBSTRUCTION NOT REQUIRING OPERATION

(MR. VICTOR DIX)

SOME degree of disturbance of micturition is so common in the late fifties and early sixties that it is perhaps not an exaggeration to say that one in every four of us will at some time begin to take a personal interest in his own prostate, and will wonder whether a prostatectomy is ultimately going to be necessary in his case. This is also true of the general public. There can be few men over the age of 55 who do not know something of the prostate and its possibilities, and to this is added an almost universal dread of the operation of prostatectomy. This dread is not entirely justified at the present time, but is a relic of days when the methods of pre-operative investigation and preparation were less advanced than they are to-day. At the same time, only an enthusiast would be prepared to state that a prostatectomy can be undertaken with as little anxiety as, for example, an appendicectomy, in a patient of the same age.

For some years there has been an additional inducement to neglect the old, well-tried and simple methods of managing cases of minor prostatic obstruction. The great advance during this time in the production of instruments capable of resecting portions of the prostate through the urethra render this operation in the hands of an expert one of very little danger, and one that may almost be called a minor procedure. "Minor" it certainly is not, but it will always remain so from the layman's standpoint because there is no visible external cutting. We are still on the crest of a wave of enthusiasm for this method with its technical appeal to the surgeon, and its "non-cutting operation" appeal to the layman, and it is well to recall that there is bound to be a tendency, while the enthusiasm lasts, to apply it to cases where old-fashioned, sound and entirely non-operative methods will relieve the patient's symptoms with equal certainty. This statement must not be construed as a condemnation of transurethral methods. This is far from its intention, since the results of transurethral operations in suitable cases admit of no criticism. What we should be careful to avoid is an immediate resort to our technical resources in the case of every old gentleman who has to pass urine twice at night and has some delay in starting micturition during the day. The sound urologist must decide in each case whether prostatectomy, transurethral methods, or careful non-operative management is required; not merely which of the two former suits the case.

We may state then that there are patients suffering from disturbance of micturition, due to an enlarged prostate, who do not, and may never, require any operative treatment at all. Careful management makes the life of these patients more than bearable. Patients who do require operative treatment, but who refuse in any circumstances to submit to it, can also be made comfortable with careful management of their lives. Here, however, the responsibility for the consequences of avoiding operation are the patient's and not the surgeon's. In what follows I do not propose to enter into the question of the varieties of obstruction at the neck of the bladder, and I shall speak principally of the patients with minor symptoms. Catheter life will not be considered.

In dealing with a patient of this type it is necessary in the first place to have a general conception of what I have termed "minor prostatic symptoms." To take an example, I should like to suggest the case of a man who for six or twelve months, or perhaps longer, has had to get up once or twice to pass urine in the early hours of the morning, and during the same time has noticed that his stream is a little less forcible than it was previously. There is perhaps also a little delay in starting to pass urine when he wants to do so. All these difficulties may be exaggerated in cold weather and such patients are often first seen in the late autumn or early winter. Other examples that suggest themselves are those of patients in whom there is a large functional element, superimposed on a real basis of prostatic symptoms; or of patients in whom social activities, important business, or other extraneous causes render postponement of operation advisable for six months or more. In all these examples it is assumed, of course, that there is no obvious suggestion in the patients' history of damage to the kidneys.

A certain minimum examination is necessary

before it can be decided that operative treatment is unnecessary. The three examinations that should never be missed are: a rectal examination, measurement of the residual urine, and estimation of the blood-urea. If the rectal examination reveals nothing even faintly suspicious of malignancy, the residual urine is no more than an ounce or two, and the blood-urea is less than 40 mg. per 100 c.cm., we may assume that a delay of six months before the case is reviewed again will do no irreparable damage, and will not render any subsequent operation more dangerous, should it become necessary because the symptoms are progressive. It may be well to state here that the reactions of the pupils, and an examination of the knee-jerks—or, better, of the ankle-jerks—should be included in the general examination in every case. This minimum examination has the advantage that it can be done by anyone, anywhere, and demands no special facilities for its completion.

The ideal examination is somewhat longer, and it is in fact a modified complete urological examination. It should include, in addition to the above, radiography of the urinary tract, microscopic examination of the prostatic fluid, an indigo-carmine function test, and a cystoscopy. Of these the examination of the prostatic fluid and the function test require little, if any, special knowledge, and can be added by the thorough practitioner to the three basic tests. A complete examination as outlined is an invaluable standard for comparison when the patient comes up again at the end of six months, in order to have his case reviewed. A very accurate idea of the rate of progress of a prostatic enlargement can be obtained in this way.

Two small but important practical points may conveniently be mentioned here. In measuring the residual urine the catheter should be passed immediately after the patient has emptied a normally distended bladder in the standing position. If a local anæsthetic has been used for the urethra, the urine should not be passed before its use. After the anæsthetic has acted the patient should rise and empty his bladder as completely as he can. He should then lie down again and the catheter can be passed. This is rather more troublesome for the patient than emptying his bladder before the local anæsthetic, but the method is much more accurate since the amount of urine that can be secreted by a nervous patient during the ten minutes that the local anæsthetic is acting could cause a serious error when the residual urine is small in amount. While the catheter is still in place an intravenous injection of 5 c.cm. of 0·4 per cent. indigo-carmine may be given. Specimens are collected at the end of five, ten and fifteen minutes; and in a perfect test the first is coloured, the second deep blue and the third also deep blue, but slightly fainter than the second.

If the result of either the short or the long examination is satisfactory, it is the duty of the surgeon to explain to the patient that his symptoms are due to slight prostatic enlargement; that many men of his age are troubled in the same way; that some of them have to have operative treatment, while others do not; that there is no way of saying at once to which class the patient belongs; that there is no danger in delay if the correct mode of life is adopted; that the correct management of his case will probably cause his symptoms to be less troublesome, or to disappear; and, most important of all, that he must be examined again and have his case reviewed at the end of six months, and afterwards at six-monthly or longer intervals. Few intelligent patients will fail to appreciate the wisdom of the above course and should operative treatment ultimately be necessary, because the condition is progressive, they will face it with the feeling that it is inevitable, and that everything possible has been done to avoid it. There will be no lingering doubts about its necessity and this attitude of the patient is of importance to his ultimate recovery.

The life of a patient with mild prostatic obstruction must be regulated to avoid attacks of retention, or partial retention; there must be no serious loss of sleep; the urinary symptoms during the day must not cause intolerable social inconvenience; and there must be no progressive renal damage.

Attacks of retention are precipitated by postponement of micturition, excessive drinking of alcohol, severe chill and, rarely, by riding and by sexual excitement. These should therefore all be avoided as far as possible. Postponement of micturition especially should never occur and prolonged postponement is a very real danger. The question of what is excessive drinking is always difficult. It would perhaps be safest to avoid alcohol completely, but little harm is to be anticipated from a moderate consumption of alcohol with meals. Apart from meals it is best avoided. Chill is often unavoidable, but attention to simple details, such as the changing of wet clothes or socks, would prevent many attacks of retention. It is unwise to suggest to patients that they should alter their sexual habits and there is no proof that sexual intercourse influences the tendency to retention. On the other hand, sexual excitement without satisfaction, as in all prostatic conditions, will undoubtedly cause trouble. The likelihood of progressive damage to the kidneys is remote if the patient fulfils his obligations, and comes again for examination at the end of six months.

Loss of sleep can often be avoided by two very simple measures. The amount of fluid after 6 P.M. may be restricted, provided that it is carefully explained that a restriction in the total daily intake of fluid is harmful and not beneficial. The second measure adopted is the use of the urine bottle. This is not always satisfactory because micturition may only be easy in the standing position, but in patients who can use it in bed it is a real comfort. Many of them find that getting up banishes sleep for an hour or two, while the use of the bottle in bed leaves them almost unconscious of the fact that its use has been necessary, and sleep is not interfered with.

There is no need to suggest any special diet, but it is necessary that condiments, spices, and other articles of food that burn the tongue, should be avoided if they cause trouble. The intelligent patient will soon discover for himself whether any of these substances affect him personally, when attention has been drawn to the possibility of their doing so.

There are two other accessory aids to comfort that I almost hesitate to mention lest I should be represented as saying that they cure the enlarged prostate. The first is prostatic massage. It will often be found in elderly bachelors, or in married men whose prostatic activity has outlasted their sexual activity, that there is a large excess of fluid in the prostate. When the prostate is merely palpated during examination, or after one gentle stroke of the index finger at the beginning of massage, fluid will be found to drip freely from the penis. Microscopic examination will distinguish between the normal fluid of a distended prostate and the pus of an old chronic prostatitis. Prostatic massage twice a week for three or four weeks, when there is distension will often cause considerable alleviation of symptoms. The second method is

particularly applicable to the nervous patient with functional as well as organic frequency. If such a patient is advised to wear a rubber urinal inside his clothes whenever the situation is likely to be such that passing water at once would be inconvenient, he will almost certainly never use it for the purpose for which it is designed. This is not because he prefers to postpone micturition until a convenient opportunity occurs, but because the desire to pass water is unlikely to make itself felt at awkward moments, when he is secure in the knowledge that should he wish to do so he could pass water at any minute.

Drugs play a minor part in treatment. I should like to mention that the old-fashioned remedies of hyoscyamus and bromides in full doses have still their use, and the Elixir Saw Palmetto and Santal Compound (Parke, Davis) often has a remarkable sedative effect.

In conclusion I should like to say that I have made no attempt to mention all the non-operative means that have been used to relieve prostatic symptoms. I need only mention X rays, diathermy and injections of hormones and glandular preparations to indicate that there is a large field I have left untouched. It has been my intention rather to show what can be done without special equipment to relieve the physical disabilities and mental anxiety of patients with early prostatic symptoms, and to enable the general practitioner to steer a middle course between the danger of undue delay in prostatic cases, and the imprudence of immediate recourse to operative treatment, whether transurethral, suprapubic or perineal.

SPECIAL ARTICLES

MEDICINE AND THE LAW

Doctor's Claim Succeeds

LITIGATION over doctors' fees often involves a dispute of facts rather than of law. Although each instance depends upon its own special facts, the general trend of decision is not without interest. In the usual absence of written contracts, is the court to accept the version of the doctor or of the patient? The doctor's version was substantially upheld in the following case which came before a midland county court towards the end of the summer. He claimed £23 6*s*. 6*d*. for professional services to the defendant's daughter. His evidence was that he treated her for neuritis in April of last year and that, as radiological treatment proved unsatisfactory, he advised a change of scene. With the defendant's approval, he said, he arranged for the daughter to stay with his mother-in-law, at a house belonging to him in France, for five weeks at a charge of £3 a week. He had remitted 250 francs to Paris in this connexion and, by way of further corroboration of his evidence, it appeared that the daughter had written a letter of appreciation. On the other side the defendant's version was that the doctor had offered the daughter a free holiday, nothing having been said about payment. The daughter had been given insufficient food, and the hall of the house in France had been flooded owing to a choked drain. In any case, argued the defendant, if there really was a liability to remunerate the plaintiff doctor, the daughter was personally liable. As for the daughter's letter of appreciation, this had been written under compulsion; she had telephoned to ask for assistance and would otherwise have had to apply to the British consul.

There was thus a typical dispute of fact between the two parties. The county court judge disallowed one item of five guineas in the claim but, apart from that, gave judgment for the doctor with costs, thus making it clear that the plaintiff's version was accepted. Recourse to the services of a professional man sets up an implied promise to pay for them. The arrangement of accommodation for a patient requiring a change of scene added a special feature for which, had the plaintiff foreseen the defendant's repudiation of liability, a written agreement would doubtless have been secured.

Insulin Treatment and Charge of Drunkenness

To a charge of drunk and disorderly conduct, heard at the Westminster police-court on Nov. 1st, the defendant replied that he had been undergoing insulin treatment and that the symptoms of his reaction thereto were mistaken for those of alcoholic intoxication. The police gave evidence that they had been called to a hotel where the management had refused to serve the defendant with intoxicating liquor; he had declined to leave and was ejected. At the police station he informed the divisional surgeon of his insulin treatment; he had taken a dose of 28 units. The fact of his treatment was confirmed by a witness who told the magistrate that the defendant had often been seen under the influence of insulin. The magistrate took into account a medical statement that a moderate amount of insulin combined with a moderate amount of alcohol would produce the effect described. He refrained from registering a conviction against the defendant and discharged him on probation, subject to his payment of the doctor's fee; this was in substance a finding of "not guilty—but don't do it again."

It is worth noting that his offence (being drunk and disorderly) was presumably charged under Section 12 of the Licensing Act, 1872; this would require proof of actual drunkenness. It is to be distinguished from another insulin case, recently discussed, where the defendant was charged under Section 15 of the Road Traffic Act with driving a motor vehicle when under the influence of drink or a drug to such an extent as to be incapable of having proper control of the vehicle. This latter charge does not require proof of actual drunkenness, but merely of "having drink taken." The Road Traffic Act provides that anyone liable to be charged under Section 15 shall not be liable to be charged under Section 12 of the 1872 Act.

Diabetic Patients and Motoring

The diabetic patient has also to remember the earlier sections of the Road Traffic Act, namely, those which require physical fitness in an applicant for a driving licence. The statutory form of application for a licence compels the applicant to declare whether he is suffering (*a*) from specified disease or disability which amounts to a disqualification (epilepsy or liability to sudden attacks of disabling giddiness or fainting), or (*b*) any other disease or physical disability which would be likely to cause his driving of a motor vehicle to be a source of danger to the public. There is of course a penalty for holding or obtaining a driving licence while disqualified and also for knowingly making a false statement in order to obtain a licence. The more publicity these proceedings against insulin patients receive, the less likely will magistrates be to treat them with exceptional leniency.

Antivivisection Display Banned

Municipal action has been taken in the city of Bath to restrain the display of antivivisectionist

exhibits in a shop window in one of the principal thoroughfares. The British Union for the Abolition of Vivisection showed models representing a dog strapped down on its back and awaiting operation, its mouth held open by a metal gag, and a cat strapped face downwards. Presumably the premises belong to the city corporation. At the instance of the chairman of the Corporate Property Committee the town clerk wrote a letter to the lessee who had sublet the shop to the Union. The chief constable had called at the premises and pointed out that, though there was no legal objection to the exhibits, he would prefer, to avoid ill-feeling, that they be not displayed. Protests, it appears, had been raised by parents on the ground of the effect of the display on sensitive children. Counter-protests, against the interference of the municipal authorities with the Union's propaganda, have also been vigorously made.

PHYSIOLOGICAL SOCIETY AND SOCIETY OF CHEMICAL INDUSTRY

AT a joint meeting of the food group of the Society of Chemical Industry and the Physiological Society on Oct. 20th, with Mr. L. H. LAMPITT, D.Sc., in the chair, a discussion on

Diet from the Chemical and Physiological Points of View

was opened by Prof. H. E. ARMSTRONG, F.R.S. (City and Guilds College). If we continued to lower our diet, he said, we should ultimately die out. Scientific service, nowadays, might be tainted by industrial commitments. The brewers were embarking on a "drink more beer" campaign, but if beer were worth drinking it would need no advertising. Bread was no longer fit to be the staff of life, milk was not all it should be, and the adage "eggs is eggs" no longer held. If we once learned to feed ourselves properly we should be sure of health. It had been shown that large colonies of rats could be so fed, over long periods of time, that they remained entirely healthy. If rats why not cows? This seemed to him to offer the only chance of getting rid of tuberculosis. Grass, like every other cereal, needed cultivation. If summer grass, properly cultivated, was dried and fed to cows during the winter they would produce summer milk. At Christ's Hospital part of the herd had been set apart and fed on dried summer grass, and one group of young boys had been chosen to receive milk from the part of the herd fed on summer grass, and another group to receive milk obtained from the rest of the herd. It was too early to decide the effect on the boys, but the effect of the summer grass on the cows had been magical.

Mr. A. L. BACHARACH (Glaxo Laboratories) said that physiologists sometimes complained that chemists, especially food chemists, were lamentably ignorant of physiology. Yet in the latest edition of "Food and the Principles of Dietetics," by Dr. Robert Hutchison and Prof. Mottram, he had been impressed by the extent and precision of the chemical information and by the large number of physiological problems to which there appeared to be no definite answers at present. The food chemist, preparing an artificial foodstuff, wanted to know what relative proportions of fat, protein, and carbohydrate, what vitamins and minerals, what trace metals were essential to human nutrition; on many matters he asked the physiologist in vain for enlightenment. In 24 pages of Hutchison and Mottram, examined at random, there were no less than eight physiological points upon which the authors found themselves unable to make a definite statement. Dr. G. C. M. M'Gonigle, in a letter published in the *British Medical Journal* of June 29th, had insisted that all nutritional investigations were crippled by the absence of any accepted standards of nutrition or criteria of malnutrition. It was commonplace knowledge that 40 per cent. of the fat taken into the body by the mouth could not be accounted for, and some of the most fundamental facts about fat absorption were the subject of controversy. Since fats carried in their unsaponifiable matter substances of great physiological importance, it was a practical necessity to know whether this unsaponifiable matter was released in the alimentary canal or not. If it was, the constituents might be freely utilised, but if they were not released until fats were withdrawn from storage it was conceivable that the body might store up large amounts of vitamin A, for example, in the fat deposits, and yet be unable to use it owing to some breakdown at the katabolic stage. Prof. Armstrong appeared to believe there was "a sort of a something" in all fresh foods which was absent in all processed ones. But to approve of good cooking did not involve condemnation of good canning, and the best tinned tomatoes were not inferior to the worst untinned ones.

Mr. G. L. PESKETT (National Institute for Research in Dairying, Reading) described some experiments on diet and lactation in the rat. Three diets were used, the constituents including whole wheat, linseed cake, casein, butter, calcium carbonate, sodium chloride, carrots, yeast, whole milk dried or raw, and fresh ox-liver. From the first diet yeast, raw milk, and liver were omitted, and failure of lactation occurred in 31 per cent. of the animals, although growth and littering were normal. In the second diet only raw milk and liver were omitted, and again there was a high percentage of failures in lactation. The third diet contained all the constituents with the exception of dried milk, and on this diet lactation occurred normally in about 98 per cent. of cases. It might be that external influences were affecting the results, but the animals lived under controlled conditions; or some disability might be inherent in the rats, but no obvious hereditary factor had been discovered. It seemed likely that some obscure food deficiency was leading to non-lactation in the experimental animals.

Prof. S. J. COWELL (St. Thomas's Hospital) discussed thyroid enlargement in relation to food. One school, he said, stressed the importance of a deficiency of iodine in the diet, and another school the importance of goitre-producing substances present in certain foods. The incidence of goitre could be reduced if the iodine in the diet was increased, but it was difficult to cause the disappearance of established goitre by giving iodine. If the maternal diet during pregnancy and lactation was rich in iodine goitre could only be produced with difficulty in the young. There was also evidence that certain foodstuffs could produce goitre; rabbits fed on a diet of cabbage sometimes developed the condition, and excess of calcium gave rise to it in rats, but in most cases the goitre-producing properties of the diet could be counteracted by giving iodine.

Mr. A. S. PARKES, D.Sc., F.R.S. (National Institute for Medical Research), discussed growth and reproduction in rats fed on a normal diet. The young rat weighed 3–6 g. when born, and if the food-supply was unlimited the rate of growth was amazing. The young mouse normally weighed 7–9 g. when 3 weeks

old, but if suckled by a rat might reach a weight of 20 g. at the same age and become so fat as to be immobilised. Pregnancy in the rat lasted 23 days, but if pregnancy occurred while the rat was suckling the previous litter, delivery might not occur for 30 days or more. Œstrus usually followed immediately on parturition, but if the rat was suckling three or more young the next œstrus was delayed for three weeks. This inhibitory effect of lactation was not found if only one or two young were being suckled. Thus, even in the absence of any dietary deficiency, curious things might happen. Degeneration of the testes in the rat, following vitamin-B deficiency, was not histologically specific; a similar degeneration occurred if an animal was starved, or following exposure to X rays. If pregnant female rats were fed on a diet deficient in vitamin E the fœtuses died suddenly at about the middle of gestation and were reabsorbed.

Prof. J. C. DRUMMOND (University College, London) wondered whether we had lost the instinct for consuming suitable foods. At Reading, in the early days of study of diet, three groups of pigs were fed on different diets; those given a normal diet spent their time basking in the sun, those short of calcium licked lime off the walls, while those lacking vitamin A rooted out every blade of grass they could find. Rats would make an intelligent choice of food from a variety of dishes, but there were few traces of this instinct in man, unless they were detected among children robbing an orchard, or in the cravings of pregnancy. He had known cases which had developed scurvy, although fruit was available; the individuals happened to dislike fruit. The Masai of Africa were nomads living chiefly on flesh and milk, and were of fine physique; whereas among the Kikuyu the use of green vegetables was taboo to the men of the tribe, and their nutrition was markedly affected; their women, however, ate green vegetables and were better nourished. What was the instinct, he asked, which should lead us to eat a natural diet, and how had it been lost?

Dr. M. W. GOLDBLATT (St. Thomas's Hospital), speaking of obesity, said that a stationary weight might be deceptive, the body fat being gradually replaced by water. The obesity of over-eating was a rarity. Among 294 cases seen at St. Thomas's Hospital, 100 were adolescents and children; 35 per cent. of them had been fat since birth, 31 per cent. became fat at the time of the second dentition, and 34 per cent. at puberty. The change was not associated with an alteration in the intake of food. Among 194 adults exogenous obesity due to overeating only occurred in 23 per cent.; they admitted it and were proud of it. In the remainder obesity was endogenous and dated from birth in 29 per cent., from puberty in 33 per cent., and followed childbirth in 38 per cent. Most fat people, then, were fat from obscure causes, associated with the important sex events and endocrine disturbance. It was only in rare cases that definite evidence could be obtained from metabolism experiments that obese subjects were more liable to form fat from sugar than were normal controls. The ordinary methods of respiratory quotient determinations were inadequate to detect the cellular abnormalities which led to marked depositions of fat. Treatment with gland preparations was of little use unless supplemented by careful dietary regulation. In this connexion it was always to be kept in mind that carbohydrate (glycogen) led to great retention of water in the tissues.

Dr. R. D. LAWRENCE (diabetic clinic, King's College Hospital) said that in diabetes the storage and burning of carbohydrate foods was principally defective, but the diet might be varied considerably without making any difference to the sugar production or to the amount of insulin necessary. It seemed to be a question of the total caloric intake rather than the balance of constituents in the diet. Possibly all foodstuffs were turned into sugar before burning, or else insulin was concerned with the metabolism of protein and fat, as well as carbohydrate.

Prof. M. S. PEMBREY, F.R.S. (Guy's Hospital), said that weight and size were not biological conceptions. Unless there were variations there was no adaptation; logically, there could be no normal. The chemist liked purity, but under natural conditions purity was pathological. The idea of pure milk was nonsense; we wanted bacteria if we were to develop resistance. The food chemists should not aim at purity or imagine that a thing which was synthesised was better than something which was natural; they should think in terms of biology, not of chemistry, for they could not afford to forget that even civilised man possessed the essential physiological characteristics of his remote ancestors. Fatness and thinness were a matter of temperament, but there was little doubt that the conservation of energy held good in each case; apart from the output of energy in the form of muscular activity it was important to remember the variations in the loss of heat by the skin.

Prof. H. A. HARRIS (University College Hospital) reminded Prof. Drummond of an experiment carried out in America in which young children were allowed to choose their food from some 18 dishes. It was found that in a general way they showed an instinct for diet—the rachitic child, for example, went for the eggs and butter. He thought obesity was common among those who had risen to comparative affluence from the working-class.

MULTIPLE CRANIAL NERVE PALSIES

THE SEMON LECTURE

FOR the subject of his lecture, delivered at the house of the Royal Society of Medicine on Nov. 2nd, Prof. H. Burger, of Amsterdam, chose "The So-called Associated Paralyses of the Larynx and Pharynx," recalling that his first footsteps in the way of the neurology of the larynx were guided by Sir Felix Semon.

In the first place, Prof. Burger discussed the question whether the vagus or the accessory nerve supplied the motor innervation of the larynx. Willis considered the eleventh cranial nerve, named after him, to be confined to the innervation of the neck and shoulder muscles; later on, but even as early as in Scarpa's time, it was thought to supply the motor nerves of the pharynx and larynx. But for the last 40 years the old opinion has been readopted that the eleventh nerve has nothing to do with the vocal cords, although Semon reported a series of cases of combined paralysis of the cord and neck muscles, while other symptoms of paralysis of the vagus were not apparent. On the other hand it has been shown that a unilateral lesion of the vagus does not affect the heart and respiration, and this is an instance of the kind of difficulty frequently present in these investigations. Thus, it is acknowledged that the sensory supply to the larynx is by the superior laryngeal nerve, but nevertheless sensory affections are seldom found in high lesions of the vagus. The

sensory supply of the larynx is very variable; sometimes the glossopharyngeal nerve supplies sensation to the aditus laryngis, and the recurrent nerve also sends sensory branches, while the superior laryngeal nerve may send fibres across the middle line to the opposite side. Again, unilateral paralysis of the cricothyroid muscle, produced by lesions of the superior laryngeal, is difficult to detect, and impossible when recurrent paralysis coexists. Similarly, when the ninth nerve is paralysed, the sense of taste may be affected, but the rôles played by the glossopharyngeal and chorda tympani nerves in the supply of this function vary greatly.

It was, he said, thought in the last century that the motor supply of the palate was from the facial nerve, but Beevor and Horsley showed that it came from the vagus and accessory; combined paralysis of face and palate is very uncommon, but Avellis, out of 150 cases of paralysed cord, found 10 cases of homolateral paralysis of the palate; here again a unilateral paralysis of the palate may easily pass unnoticed, or may recover while the cord is still affected. Combined paralysis of the vocal cord and phrenic nerve is very rare; of this Prof. Burger reported a recent case from his experience. It was formerly believed that paralysis of all four last cranial nerves was necessarily of bulbar origin, but it is improbable that a lesion of such an extensive area as to involve these four nuclei would occur without other bulbar or cerebral symptoms. There may be a combined paralysis of the ninth, tenth, and eleventh nerves in the jugular foramen; and this syndrome must be distinguished from that of Hughlings Jackson where the tenth, eleventh, and twelfth nerves are involved but the ninth escapes. Here a lesion of the nuclei or roots is topographically improbable; the trunks of the tenth and eleventh nerves run in a common dural sheath, which lies close beside the ninth but which is separated from the twelfth by a broad bony wall; outside the cranium they are only divided by a sharp edge of bone, and therefore this syndrome is much more likely to be caused by an affection below the base of the skull.

He next directed attention to the "parapharyngeal space," bounded internally by the constrictor muscles, behind by the transverse processes of the vertebræ, and externally by the ascending ramus of the mandible and the parotid gland; 14 years ago he suggested the injection of this space with novocain as a preliminary to tonsillectomy. In it run the ninth, tenth, and twelfth nerves, and the cervical sympathetic, and injection of it causes temporary paralysis of the soft palate, rarely of the face, occasionally slight symptoms of paralysis of the sympathetic, and affection of the sense of taste; the facial nerve is presumably reached in the parotid gland through a constantly present opening in the parotid fascia; the vagus running through the space does not suffer at all from the injection.

A SIMPLER CLASSIFICATION

We must refrain, Prof. Burger insisted, from putting up a series of syndromes on the basis of accidental combinations of paralyses, even though these syndromes bear the names of distinguished medical men. Few neurologists or laryngologists can tell without consulting their books exactly the difference between the syndromes of Avellis, Hughlings Jackson, Moritz Schmidt, Tapia, Vernet, and Collet; these named syndromes are unpractical and confusing, and a new classification and nomenclature are needed. Neurologists in frequent contact with cases of associated paralyses of cranial nerves do not fetter their minds by trying to fit every combination into a little compartment with a name of its own. Prof. Burger suggested a simpler classification.

1. Syndrome of the bulbar nerves, including the paralyses of the vago-accessory of central and extramedullary origin.
2. Syndrome of the jugular foramen, including peripheral cases both within the foramen and outside the skull, involving the ninth, tenth, and eleventh nerves.
3. Syndrome of the parapharyngeal space, the characteristics of which are paralysis of the ninth, tenth, and twelfth nerves, and of the sympathetic; this means a low vagus lesion usually without paralysis of the palate or eleventh nerve.
4. The recurrens-phrenicus syndrome, the rare combined paralysis of cord and diaphragm.

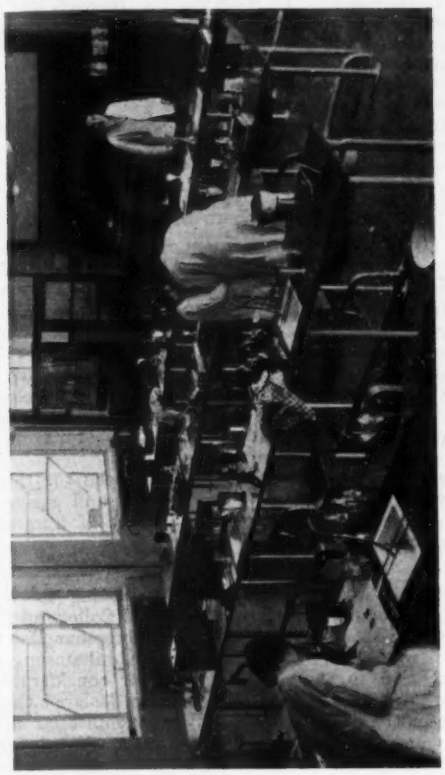
SEMON'S LAW

The concluding part of the lecture was devoted to a discussion of Semon's law. This, in Prof. Burger's view, is not actually a law, but an hypothesis, an attempt to explain the surprising fact that a lesion of the recurrent laryngeal nerve can reveal itself in two ways, either with the vocal cord in the median position with retention of its tone-giving function, or with arrest in the "cadaveric position." Semon taught that the former indicates paralysis limited to the abductor or posticus muscle. Krause maintained that this median position was due not to paralysis but to stimulation, but this is negatived by the associated paralyses; how can there be spastic contraction only of the posticus with paralysis of all the other muscles involved? Grossman's theory that the median position is an expression of complete paralysis is more difficult to dismiss. There is, however, an increasing doubt of the truth of Semon's law. In syringobulbia and in multiple sclerosis, paralysis of the cord frequently assumes atypical forms. Other objections are that no one has ever succeeded in producing a posticus paralysis experimentally in animals, and that in an existing posticus paralysis destruction of the recurrent laryngeal nerve causes no change in the position of the cord; on the contrary the expected outward movement does not occur. He mentioned the theory that the cord assumes the median position in lesions of the recurrent nerve, and the cadaveric position when the superior laryngeal nerve is also involved.

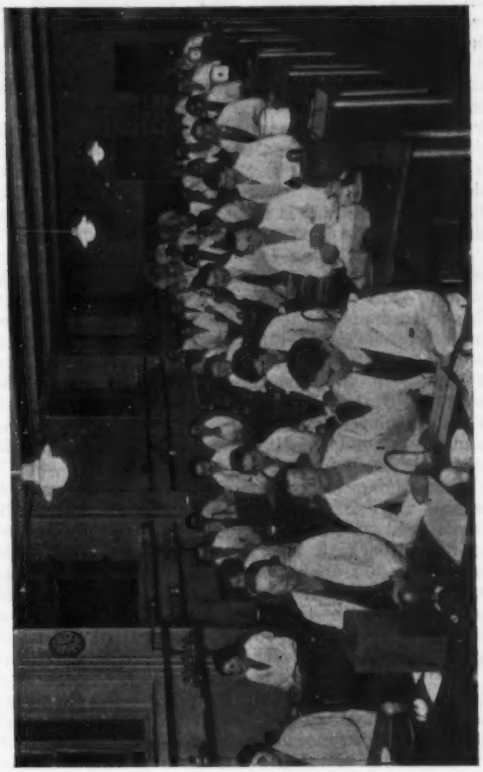
ROYAL FREE HOSPITAL
NEW PATHOLOGY DEPARTMENT

THE pathology department at the Royal Free Hospital has long been uncomfortably overcrowded, and the decision to allocate the basement floor of the Eastman Dental Clinic, adjoining the hospital in the Gray's Inn-road, to pathology will afford welcome relief. The expansion occurs opportunely at a time when a new plan of teaching pathology is being inaugurated, and indeed was essential for the development of this scheme. Whereas formerly instruction to junior students in pathology was effected by means of "posts" (successive periods of three months, during which 12 to 15 students did practical work in a small laboratory for nearly the whole of each working day), the new plan is to spread an elementary course in general pathology over the whole of an academic year. This necessitated the provision of a large room (labelled Teaching Laboratory in the plan), which accommodates 60 students at a time in practical classes. Adjoining this laboratory

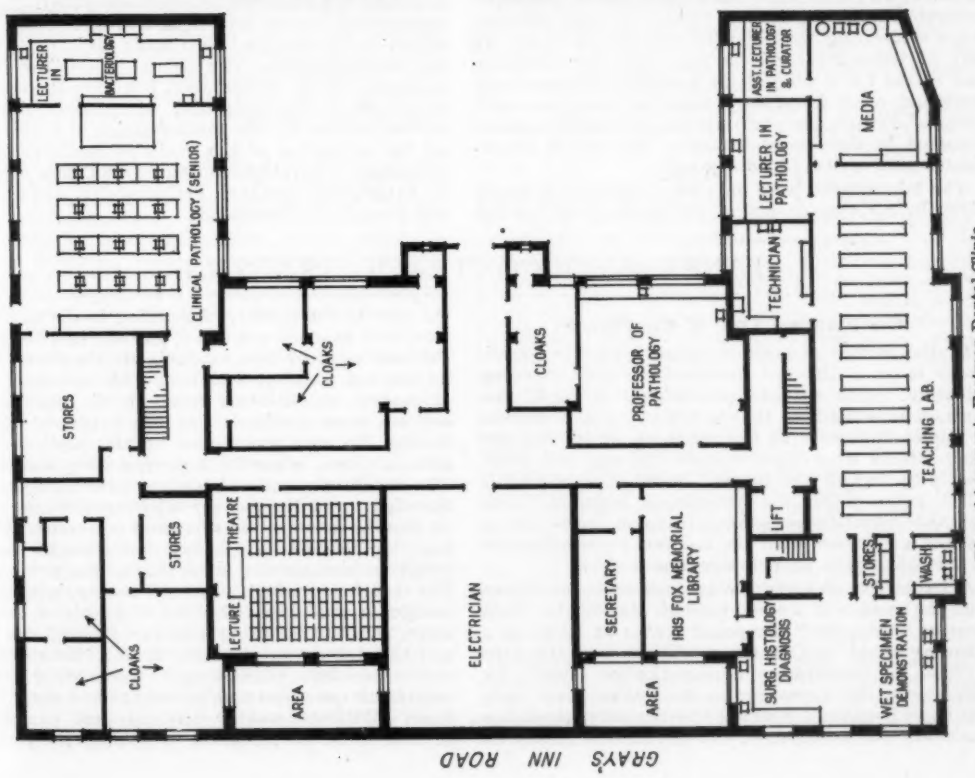
ACCOMMODATION FOR PATHOLOGY AND BACTERIOLOGY, ROYAL FREE HOSPITAL



Laboratory for clinical pathology.



Teaching laboratory.



Plan of basement, Eastman Dental Clinic.

are rooms for lecturers and technicians, for the preparation of media and class material; and for the cleaning and storage of apparatus. Space is provided in a room partly occupied by the technician in charge of routine surgical histology for small demonstration classes on wet specimens, of which a collection is provided. Next to this room is the Iris Fox Memorial Library; Dr. Iris Fox, senior assistant pathologist to the hospital, died in 1926 from sepsis contracted while performing a post-mortem examination. Opposite the library is the professor's room, and this wing houses also the secretary to the unit.

In the other wing is a small lecture theatre—a larger theatre being available on a higher floor of the building—and also a laboratory for clinical pathology. This accommodates the resident pathologist, appointed annually, who is in charge, under the lecturer in bacteriology and the professor, of the routine clinical pathology of the hospital. It also accommodates the A. M. Bird Research Scholar of the year, as well as four senior students, the latter changing every month. Beyond this laboratory is a room for the lecturer in bacteriology.

When the new accommodation became available the post-mortem rooms and the museum could not be transferred, and these remain as previously behind the main block of the Royal Free Hospital. The floor of the old department of pathology, below the museum and post-mortem rooms, has been redesigned and allocated to the subdepartment of chemical pathology. This has provided the additional space urgently required by this expanding department. It now consists of a large and a small biochemical laboratory, rooms for the lecturer in biochemistry and the chemical pathologist, and a waiting-room for patients; it has, moreover, been possible to set aside a room exclusively for basal metabolic-rate estimations. Two rooms have been equipped as students' laboratories for ward tests. There are two passageways connecting the old with the new unit, one by way of basement corridors and the other over the roof of the Levy wing of the hospital. Wassermann tests and other laboratory work in connexion with venereal diseases are performed in a special laboratory attached to the venereal clinic; this also is a subdepartment of the pathology unit.

The laboratories were on view at an evening party given by Sir Alan Anderson, chairman of the London (R.F.H.) School of Medicine for Women, and Lady Anderson, on Nov. 2nd, when the newly appointed professor of pathology, Dr. R. A. Webb, was introduced to the guests.

IRELAND

(FROM OUR OWN CORRESPONDENT)

MASTERSHIP OF THE ROTUNDA HOSPITAL

On Nov. 3rd the governors of the Rotunda Hospital proceeded to the election of a Master in succession to Dr. Bethel Solomons, whose term of office had expired. Their choice fell on Dr. Andrew Hope Davidson. Dr. Davidson obtained the medical degrees of the University of Dublin in 1917, and almost immediately entered the Royal Army Medical Corps, in which corps he served in Palestine. On his return to Ireland he entered the Rotunda Hospital as clinical assistant, and held the position of assistant master from 1919 to 1922. In 1924 he was appointed gynæcologist to Dr. Steevens' Hospital. He has been for the past seven years professor of midwifery and gynæcology in the school of the Royal College of Surgeons in Ireland.

THE DUBLIN HOSPITAL PROBLEM

In his address to the annual opening meeting of the Biological Society of the Royal College of Physicians and the Royal College of Surgeons last week the president, Prof. Leonard Abrahamson, drew attention to the pressing need for consideration of the Dublin hospital problem. He declared that the present archaic hospital system militated against advance in medicine and surgery. Whatever the advantages, if there were any, of numerous small hospitals, the disadvantages preponderated. Although unexpected money had been available from sweepstakes no attempt had been made radically to change the present system. The blame did not lie with those in charge of the sweepstakes, but with the staffs and governors of the hospitals, who should provide a unified scheme for the amalgamation of hospitals and for the utilisation of the available funds to the best advantage. Dr. Abrahamson's views were supported by subsequent speakers, including Mr. James Owens and Prof. T. G. Moorhead.

PANEL AND CONTRACT PRACTICE

On Walking Out of the House

In the matter of attendance an insurance practitioner is on a different footing from one attending privately. The private practitioner is under no contract to attend, so that in the event of a dispute or unpleasantness with the relations—it is generally the relations who cause trouble—he can and often does walk out of the house. Some other doctor is called in to finish the attendance required. The insurance practitioner cannot leave in such a way. He has a contract with the insurance committee to do this work or to provide someone to do it.

A letter was received by an insurance committee from the mother of a panel patient, stating she "had occasion to require" her panel doctor at 12.30 on a Saturday night in December. There was difficulty at first in establishing communication either by telephone or by messenger as the doctor lived some four miles from the surgery, but eventually telephonic connexion was established, and the mother explained the case to the doctor. According to the mother, he then said he could not come, and she had better send the case into hospital; according to the doctor he said he was not well but would send his assistant, or one of several practitioners near, in his place. Their services were declined. As the evidence was conflicting the case was heard by the medical service subcommittee, when the following story was elicited. The daughter's acute abdominal pain disappeared in the night, and the mother telephoned to the doctor on Sunday morning that he need not come. He was expected to visit on Monday, but thought from the telephone message of Sunday that he was not required. The daughter visited him on Tuesday, when a first certificate was given with the diagnosis of duodenal ulcer. On the following Tuesday the girl was worse and the doctor was sent for again. He called, but soon came into conflict with the mother both as regards his questions and as to what had already been done. Without making any physical examination he announced his intention to give up the case, and

left the house. Another practitioner was called in, and the patient was sent to hospital, where some months later an operation was performed.

After sifting the evidence the committee found corroborative evidence that the services of a second doctor were offered on the occasion of the night call, and decided there had been no breach of the terms of service in neglecting to attend on that occasion, but that there was neglect—and therefore a breach of the terms— in walking out of the house, without finding out what was the matter, and without providing someone else to give any necessary treatment. The practitioner appealed on the ground that this was a new charge brought up against him during the hearing, and of which he had not been given notice. He had been prepared to defend the night-call question and had done so with success, but when the question of walking out arose the case should have been adjourned to allow him to prepare his defence. The Minister allowed the appeal without hearing either side.

It has, of course, been recognised that if during the course of a hearing, (say) for failure to attend, some question of giving improper certificates arises from the evidence of a witness, then the case is adjourned—if the practitioner requires—so that he may have an opportunity of getting evidence to rebut the fresh point raised. Here, however, the doctor was informed by the clerk before the inquiry that he would have to consider whether he gave all proper and necessary medical service. If this decision is taken as a precedent it may lead to much adjournment in the consideration of complaints against doctors; for if the complainant does not mention in writing every item of alleged neglect of treatment, but at the hearing makes further charges about neglect of treatment in the same illness, then the case must be adjourned to enable the doctor to deal with a new charge. Otherwise on appeal the doctor will win his case purely on technical grounds.

A practitioner whose attendance is made insupportable by friction with the patient's friends has his remedies, if such they can be called—namely, first to induce the patient to change to another doctor, or to report the matter to the insurance committee, when the medical service subcommittee would hold an inquiry. But the committee is powerless to deal with such a patient if found to be in the wrong. The worst they can do to him is to suspend him from medical benefit, and the offence would have to be quite serious before that would be done. Alternatively, they can inpose a fine, but if the insured person does not agree to pay it there seems no means of making him.

PUBLIC HEALTH SERVICES

A Survey of the Housing Problem

AT this opportune moment Sir Francis Fremantle, M.P., has issued a "Concise Survey of the Housing Problem" for the information of all whom it may concern, and especially for the guidance of local authorities and their health officers. In a sound introduction he sets out the origin of the slum evil in the industrial revolution of a century ago, the radical change in the position during the last 60 years, and the present fact that not sufficient provision has yet been made for housing the lowest grades of the people. Of the acute need, he says, there can be no doubt and he illustrates the inevitable deterioration in the following passage:

"In these conditions mental rest is impossible for the weary mother, the tired husband, the children with their receptive minds and their lessons to prepare. Morality is inevitably undermined; discontent and demand for redress, even by force and against private rights, is inevitably fostered. Slums and overcrowding are the soil of anarchy and of physical, mental, and spiritual decline. To remedy them is a crying need in the name of humanity; and a most profitable and hopeful policy for the strengthening of the nation."

Besides dealing with actual slums he indicates the need not to overlook (1) the repair of houses to prevent their deterioration into slums; (2) the provision of new buildings to keep pace with the increase of population and to replace old houses which have outlived their usefulness.

The survey includes a brief summary of pre-war housing legislation, of the general effect of pre-war policy, and a very carefully documented epitome of post-war legislation, concluding with an account of the work of voluntary associations. Three appendices contain (1) the procedure under the Housing Act of 1930; (2) the number of houses completed by local authorities and private enterprise, from the armistice to the end of June last; and (3) a summary of the Moyne report. The pamphlet, which has 43 pages, may be obtained for 4*d*. from the secretary of the Unionist Central Office, Palace Chambers, Westminster, S.W.1.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 28TH, 1933

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 4 (last week 0); scarlet fever, 4202; diphtheria, 1319; enteric fever, 41; acute pneumonia (primary or influenzal), 819; puerperal fever, 36; puerperal pyrexia, 95; cerebro-spinal fever, 18; acute poliomyelitis, 31; acute polio-encephalitis, 4; encephalitis lethargica, 5; dysentery, 21; ophthalmia neonatorum, 81. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Oct. 31st–Nov. 1st was as follows:—Small-pox, 5; scarlet fever, 3262; diphtheria, 1989; enteric fever, 28; measles, 377; whooping-cough, 131; puerperal fever, 22 mothers (plus 6 babies); encephalitis lethargica, 255; poliomyelitis, 6; "other diseases," 161. At St. Margaret's Hospital there were 15 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In 118 great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 0 (0) from measles, 4 (1) from scarlet fever, 13 (3) from whooping-cough, 35 (11) from diphtheria, 71 (24) from diarrhœa and enteritis under two years, and 42 (8) from influenza. The figures in parentheses are those for London itself.

Of the deaths from diarrhœa 4 each occurred at Leeds, Liverpool, and Birmingham, 3 at Birkenhead. The fatal cases of enteric fever were reported from Hull and Northampton. Manchester reported 4 deaths from measles. Three fatal cases of diphtheria occurred at Liverpool, 2 each at West Ham, Burnley, and Leeds. Small-pox was mentioned as a cause of death last September in a case assigned to Batley, M.B. (Yorks, West Riding).

The number of stillbirths notified during the week was 223 (corresponding to a rate of 41 per 1000 total births), including 41 in London.

FILM EXHIBITION.—An exhibition of home and industrial film equipment will be held at Dorland House, 18–20, Regent-street, London, S.W., from Nov. 27th to Dec. 9th. It will be open from 10 A.M. to 10 P.M. each day.

CORRESPONDENCE

CHRISTINE MURRELL MEMORIAL

To the Editor of THE LANCET

SIR,—Many friends and associates of the late Dr. Christine Murrell will wish to give expression to their affection and gratitude in a way that will perpetuate her memory and at the same time help to carry forward the work of which she was so enthusiastic a pioneer. The St. Marylebone Health Society are shortly going to build a new infant welfare centre and day nursery on the site of the centre where Dr. Murrell started an infant consultation in 1907, worked for 18 years and then became honorary consulting physician. This land has been presented by Capt. the Hon. Gerald B. Portman. It is felt that the memorial to Dr. Murrell could take no better form than a contribution to the permanent equipment of part of this building, with which it is hoped to associate her name.

Contributions will be gratefully received by Mrs. Russell Brain, 31, St. John's Wood Park, London, N.W.8. Cheques should be made out to "Christine Murrell Memorial Fund," and crossed Westminster Bank.—We are, Sir, yours faithfully,

E. HONOR BONE, CHARLES PORTER,
R. LANGDON-DOWN, SOPHIA SEEKINGS FRIEL,
MARIE LAWSON, GRACE BUCKLEY,
MABEL L. RAMSAY, MARY MOSTYN BIRD,
ERIC PRITCHARD, STELLA BRAIN.

Nov. 6th, 1933.

CARBOHYDRATE METABOLISM IN HYPERTHYROIDISM

To the Editor of THE LANCET

SIR,—Dr. Norman Kletz in your last issue (p. 1024) discusses the disturbance of carbohydrate metabolism in hyperthyroidism. He mentions that thyroid feeding empties the liver of glycogen but does not mention the fact, perhaps of greater clinical importance, that the heart glycogen is also depleted. This was clearly established by Dr. McCance and myself in 1931 (Biochem. Jour., XXV., 570). In view of disordered heart action in hyperthyroidism our finding is at least of interest, and as it has not been noticed in subsequent clinical or other publications we beg to draw attention to it in your journal. Thyroid feeding in animals causes complete depletion of heart glycogen—as early, if not before, liver glycogen. We have had no opportunity of estimating the heart glycogen in human hyperthyroidism (post-operative deaths in thyroid crises are rare now), but it is a point of investigation which is of great interest, and might be remembered in unfortunate cases. It may be that the cardiac disturbances in Graves's disease are essentially due to a lack of heart glycogen.

I am, Sir, yours faithfully,

R. D. LAWRENCE.

Biochemical Department, King's College Hospital, Nov. 6th, 1933.

To the Editor of THE LANCET

SIR,—I was interested in Dr. Kletz's article in which he gives his experience of the treatment of thyrotoxicosis by the high carbohydrate diet which I have advocated. During the last five years I have continued to use the high carbohydrate diet as part of the therapeutic programme in all cases of hyperthyroidism, and have uniformly obtained good results. The cases have not been treated by diet alone, but the impression gathered has been that patients suffering from hyperthyroidism invariably have done better when the high carbohydrate diet was included in the treatment. The benefit of giving carbohydrates freely and of reducing the proteins and fats (the diet averaged P 80, F 60, C 300–400) was twofold, and was shown both in the diminution of dyspeptic symptoms, so common in this disease, and in the lessening of the signs and symptoms of thyrotoxicosis.

In his paper Dr. Kletz remarked that when glycosuria or hyperglycæmia is found the case should be fully reviewed, and any carbohydrate bias in the diet should be supported by adequate dosage of insulin. Glycosuria accompanying thyrotoxicosis, however, is not always a contra-indication to the use of a high carbohydrate diet, and insulin is often unnecessary. In my article (Brit. Med. Jour., 1928, ii., 251) I mentioned a case of hyperthyroidism exhibiting a mild type of diabetes (confirmed by a glucose-tolerance test), in which the urine rapidly became sugar-free when the patient was given a high carbohydrate diet. At the time of writing the paper (1928) practically no experience of high carbohydrate diets in diabetes was as yet available, and I therefore considered the response of thyroid glycosuria to carbohydrates to be somewhat paradoxical, but I suggested that the glycosuria might be explained by a defective liver function dependent upon the thyrotoxicosis. In a recent discussion on high-carbohydrate low-fat diet in diabetes at the Royal Society of Medicine (Proc. Roy. Soc. Med., 1933, XXVI., 1607) the view was put forward that the increased sugar tolerance shown on starchy diets was due to increased functional activity of the liver. Experimental work in animals has certainly shown that prolonged thyroid feeding depletes the glycogen reserves in the liver (Cramer, Burns, and Marks).

There is therefore some reason to suppose that the disappearance of certain types of glycosuria in hyperthyroidism resulting from carbohydrate feeding is due to an increased functional activity of the liver, and this would lend support to the view that carbohydrates have a similar beneficial effect upon thyrotoxicosis in general.—I am, Sir, yours faithfully,

Leeds, Nov. 6th, 1933. H. H. MOLL.

PROTECTION FROM X RAYS AND RADIUM

To the Editor of THE LANCET

SIR,—We would like to assure your readers that the discrepancy in detail between Recommendation 3 and the Appendix to our Report in your last issue, and to which you drew attention, is more apparent than real. It has long been the custom to do blood counts in the morning period in order to be rid of the rise in the afternoon blood figures, which was thought to be due to the customary midday meal.

The Appendix, however, draws attention to recent work on the blood, from which it appears that this rise in blood count is not due to feeding, but is rather one phase of a very complicated process operating throughout the cycle of 24 hours. This recent addition to our knowledge was included as an Appendix to the Report, for it was thought that those in charge of departments where blood counts are undertaken were better served by having an alternative procedure put before them.

We are, Sir, yours faithfully,

STANLEY MELVILLE,
SIDNEY RUSS,
Hon. Secs., X Ray and Radium Protection Committee.

Nov. 6th, 1933.

THE FACT OF DEATH

To the Editor of THE LANCET

SIR,—A few comments on your well-informed leading article of Oct. 28th may be of value. The Act of 1926 was not in its earlier stages a Government measure, but a private member's Bill promoted by the Federation of Medical and Allied Services, although prepared in consultation with the official authorities and with their assistance. While the new Act did not, it is true, contain any provision as to examination of bodies after death, the Bill as introduced did include such provision. The circumstances are instructive and it may be worth while to recall them.

The original programme of the Federation had included the requirement that in no circumstances should death registration or burial take place before the body had been medically inspected. It became clear, however, during the debate that this universal 100 per cent. provision, if pressed, would be defeated by the standing objections to it. These included not only that of an expensive provision against "a very small chance indeed" but also the severely practical objection that in certain parts of the country the plan was unworkable, in certain cases unnecessary, and would lead either to bodies lying unburied or to attendance upon the sick being neglected for attendance upon the dead. As a compromise the Federation accepted with some reluctance an alternative which was felt to supply the substance of what had been contended for while avoiding its previous pitfalls. This proposal would empower the county, county borough, city, and metropolitan borough councils to make arrangements for the medical verification of the fact of death in their respective areas under conditions as elastic as would be essential for practical working purposes. The clause to this effect (Clause 7) was accordingly included in the Bill and commented upon favourably on second reading in the House of Commons as a fortunate solution of a long-standing deadlock.

Clause 7 ran as follows:—

> 7. (1) *Power to provide for medical inspection of body.*—It shall be lawful for a county council or a county borough council, or in London, for the common council of the City of London or for a metropolitan borough council, with the approval of the Minister of Health, to make such arrangements as they may think fit whereby, in any case where the body of a deceased person has not been seen by a registered medical practitioner since the death, the services of a registered medical practitioner are made available for the purpose of verifying, upon the request and authorisation of a coroner, the death of any deceased person dying within such coroner's jurisdiction; and where such arrangements are made, regulations of the Registrar-General may provide for notification for the purposes thereof being given by the registrar to the coroner in such cases and subject to such conditions as may be prescribed.
>
> (2) The expenses incurred by any local authority under this section may be defrayed in the case of a county council out of the county rate and in any other case as part of the expenses of the authority in the execution of the Public Health Acts, 1875 to 1925, or of the Public Health (London) Act, 1891, as the case may be.

In Grand Committee, however, the clause was opposed from both flanks, firstly by the idealists who, preferring the shadow to the substance, still sought in spite of every warning to substitute the original universal requirement; secondly, by others who thought it possible to work out during the remaining stages of the Bill some further alternative which might improve upon Clause 7 without going so far as a universal requirement. In fact no such alternative was discoverable; the clause was lost and an attempt on my part to reinstate Clause 7 at the report stage was frustrated by the fact that it would have involved the recommittal of the Bill, and, in view of the dearth of Parliamentary time, risked the total loss of its valuable remaining provisions.

If in view of the Bootle case, for instance, public opinion demands action in the matter, I am still as convinced as I was then that it would necessarily have to follow the lines of Clause 7; and the foregoing narrative may not be without its moral as to the consequences of allowing the best to be the enemy of the good, even to the extent of a desire to retain a grievance in preference to securing its removal. I am, Sir, yours faithfully,

FRANCIS FREMANTLE.

Hatfield, Herts, Nov. 2nd, 1933.

TUBERCULIN TESTS

To the Editor of THE LANCET

SIR,—In your account of a discussion on early diagnosis of pulmonary tuberculosis at the Royal Society of Medicine (Oct. 28th, p. 973), Dr. Peter Kerley, speaking of opacities in chest radiograms, is reported to have said "an intradermal tuberculin test gave a sharp focal reaction in the lungs, and the opacity cleared up in a few days; this distinguished the tuberculous type." The usual technique in carrying out this test consists of the intradermal injection of 0·1 c.cm. of 1 in 1000 old tuberculin. If properly carried out, it is most unlikely to produce any reaction other than the local reaction, and if a constitutional or focal reaction occurs it is probable that some of the tuberculin has been injected subcutaneously.

Personally I sometimes inject tuberculin subcutaneously both for diagnosis and treatment; and if used with proper regard to correct dosage I think the dangers are negligible. Many members of the profession, however, appear to regard anything in the nature of a constitutional reaction from tuberculin as likely to be attended with such dire results that it would seem desirable to have it clearly understood that the Mantoux test is free from this risk.

I am, Sir, yours faithfully,

T. W. PRESTON.

Queen Anne-street, W., Oct. 28th, 1933.

*** Dr. Kerley tells us that the actual sentence in his paper read as follows: "If a Pirquet test is made, *and there is a constitutional reaction*, serial radiograms show that a typical epituberculous infiltration develops around the thickened hilum. This epituberculous infiltration disappears very rapidly in the course of a week or ten days." The italicised part of the above sentence is of importance.—ED. L.

PERONEAL MUSCULAR ATROPHY

To the Editor of THE LANCET

SIR,—May I comment on several features of the interesting family recorded by Dr. Ian Gordon in your issue of Nov. 4th (p. 1042). In the first place I should like to question the diagnosis of peroneal muscular atrophy (Charcot-Marie-Tooth) for the following reasons. The age of onset in both the cases described was rather late, whereas this condition usually appears in childhood; and the knee-jerks in Case 2 were absent, whereas they are said never to disappear in Charcot-Marie-Tooth's disease. Secondly, I do not think there is justification for saying that "only affected females transmit the disease" in this family; it is quite clear that the abnormality, whatever its nature, is being transmitted as a simple Mendelian dominant, and the fact that

only females appear to have transmitted the disease may be due to incomplete examination of so-called normals, to pure chance, or to the rather late onset of symptoms, which would mean that some young "normals" are going to develop symptoms at a later date. This is important from the point of view of prevention, as all affected persons will tend to transmit the abnormality to half their offspring on the average.

I suggest that the condition is really hypertrophic neuritis. This disease, which is not uncommon, is transmitted as a simple Mendelian dominant; the clinical manifestations are variable but muscular wasting, claw-foot, and loss of tendon-jerks are the most frequent. The pathognomonic sign is enlargement of the peripheral nerves, but this is not always easy to demonstrate. I have performed biopsies on several cases in whom the nerves could not be felt to be unduly enlarged and have found the typical histological picture of hypertrophic neuritis (Dejerine-Sottas); even though the nerves are not apparently enlarged on palpation they are obviously thickened when exposed at operation.

I am, Sir, yours faithfully,

HUGH G. GARLAND.

Leeds, Nov. 6th, 1933.

VETERINARY RESEARCH

To the Editor of THE LANCET

SIR,—In your review of the veterinary research report for Southern Rhodesia (THE LANCET, Oct. 14th, p. 877) a sentence reading "According to workers at the laboratories of the Imperial Bureau of Animal Industry at Weybridge . . ." gives the impression that the Imperial Bureau of Animal Health (*not* Industry) is a research organisation. The position is that the Imperial Bureau of Animal Health is an organisation which deals only with the purely literary side of veterinary research; it is lent accommodation with the veterinary laboratory of the Ministry of Agriculture, Weybridge, but is not a Government department, although the director of the laboratory (Mr. W. Horner Andrews, D.Sc.) is director of the bureau. Actually, the foot-and-mouth disease research work is carried out at the Pirbright laboratory, which is a branch laboratory also under the control of Dr. Andrews.—I am, Sir, yours faithfully,

Weybridge, Surrey, Nov. 4th, 1933. W. A. POOL.

NASAL INFECTION IN THE PSYCHOSES

To the Editor of THE LANCET

SIR,—While agreeing that it is the duty of the psychiatrist, as of any other physician, to remove any discoverable septic foci from his patient, I should like to protest against the light-hearted way in which some psychiatrists seem to embark on the most mutilating and drastic operations. I have seen in the past, although less recently, psychotic patients who have been submitted to almost every surgical practice imaginable. A year ago I saw an involutional melancholic with hypochrondrical delusions, who had started with an appendicectomy followed by a hysterectomy, a double amputation of the breast, and complete removal of the teeth. In spite of all this she finally drifted into a mental hospital. There exists a vast number of manic-depressives in a depressed phase, involutional melancholics, and hypochrondrical schizophrenics as well as neurotics, who welcome almost any operation—which, however, usually leaves them considerably worse off.

Surely operative procedure of such a drastic kind should be reserved for psychoses of the organic reactive type and not for the functional types. Any psychiatrist worthy of the name should be capable of diagnosing the difference. It is, moreover, difficult to see how sepsis can cause such an exquisitely elaborated psychosis as paranoia or possible folie à deux. Even such a "disorderly" psychosis as schizophrenia shows psychological elaboration when properly examined, and the recovery or relapse is frequently correlated to psychological, not organic, factors.

To mutilate patients with functional psychoses is to disregard all the psychological discoveries of the last 40 years. It is only fair when Cotton's work is mentioned to state that this was shown to be unreliable by the careful researches of Kopeloff and Kirby.

I am, Sir, yours faithfully,

CLIFFORD ALLEN, M.D., D.P.M.

Dartford, Kent, Nov. 5th, 1933.

PROBLEMS OF ASTHMA

To the Editor of THE LANCET

SIR,—In the report of the discussion on asthma upon which Mr. Frank Coke comments in to-day's issue the reader will find the words "An attempt towards this harmony [i.e., between the biochemical and the psychological aspect of asthma] was Dr. Culpin's theory that an original emotional stimulus evoked a reflex response by which a number of physiological reactions became abnormally labile." As a hypothetical example there follows "Feather sensitiveness might in some cases be due to the juvenile association of the smell of feathers with the witnessing of sexual intercourse between the parents." Mr. Coke's opinion that "there are better ways of treating patients sensitive to feathers than by giving them explanations which seem to some of us so far-fetched" cannot be contradicted but is grotesquely irrelevant. The allusion to "the psycho-analyst with all his special training in sexual matters" marks a return to a method of attack that I had thought was obsolete.—I am, Sir, yours faithfully,

London, W., Nov. 4th, 1933. MILLAIS CULPIN.

LETTSOM

To the Editor of THE LANCET

SIR,—Whilst deeply grateful for the annotation in your issue of Nov. 4th on my recently published life of Lettsom, I regret to find that though praising the lightness of the literary fare you inveigh against the heaviness of the paper on which it is printed. The fault, if fault there be, is mine, since art paper was chosen with deliberate intent for what appeared to me to be adequate reasons. The first was that in this way the text and the illustrations could be interwoven harmoniously—always an advantage to the reader. The second, and more important, was that the book might last. Most books to-day are printed on wood-pulp paper, and librarians are already becoming alarmed at the way in which the pages of such books are beginning to disintegrate. I am told that the probable life of a great number of books so produced to-day is not likely to be more than 50 years.

Now, Eliza Lettsom's copy of Pettigrew's life of her father, which is in my possession, is as fresh as when it was published in 1817, because it was printed on hand-made paper. No one between 1817 and 1933 has tried to rewrite Lettsom's life, and it was only the fortunate discovery of the Fothergill and Elliot MSS. that made me think of doing so. These sources are now exhausted, and it is unlikely that anyone will attempt another life for another hundred years. I

felt that I should like mine to last as long as Pettigrew's, and it was for that reason I decided against ordinary paper. I am, Sir, yours faithfully,

J. JOHNSTON ABRAHAM.

Queen Anne-street, W., Nov. 4th, 1933.

PROBLEMS OF MYOPIA

To the Editor of THE LANCET

SIR,—In an annotation published last week under the above heading you do me too much honour in saying that I have pointed out that frequency distributions as found in nature are seldom symmetrical. This has been known for many years. All that I did was to dispose of Steiger's assertion that refractive errors are distributed symmetrically by taking his own data, and, having fitted a curve thereto, I was able to give the degree of skewness which characterised it; and which, I may add, was far from negligible. Apparently all eyes when lined up at the starting-point (birth) are bunched together, most of them being on the plus four mark. As the race of life proceeds they become spread out, there being a drift in the myopic direction which, according to the findings of Betsch and others, stops short on the whole at emmetropia. Apparently as growth proceeds the varying factors concerned in determining refraction are correlated in such ways that they cancel out, leaving a resultant emmetropia—a happy fact for the race. I am, Sir, yours faithfully,

Lewes, Nov. 6th, 1933. W. R. DUNSTAN.

OIL BEFORE SUNBATHING

To the Editor of THE LANCET

SIR,—"J. C. B." asks for information about the application of oil before exposing the skin to the sun's rays. Whilst in the subtropics, a few years ago, I tried the experiment of applying olive oil to half the body, leaving the other side unanointed. The result of a somewhat excessive exposure was blistering of the shoulder on the oiled side and a severe erythema without blistering on the unoiled parts. I have seen numerous cases of severe sunburn following undue reliance on the protective qualities of various oils.

Experience of sunbathing in many parts of the world has taught me that pigmentation is the only safe protective against the sun's rays. The skin of civilised man, owing to continual covering, has lost its normal protective function to a very large extent. This function can be regained and great benefit may be derived from sunbathing if caution is exercised until pigmentation has occurred. A safe rule is for the first exposure not to exceed 15 to 30 minutes, according to the person's colouring, very fair people being more sensitive than dark ones. If a marked erythema occurs, a second exposure should be avoided until this has subsided. Subsequent doses may be increased by 15 minutes a day until pigmentation sets in, when much larger exposures will be supported with considerable benefit. Over-exposure, apart from being very painful, is often followed by pyrexia, malaise, headache, nausea and vomiting. The victim usually blames the sun for his own indiscretion.

I am, Sir, yours faithfully,

Park-crescent, W., Nov. 7th, 1933. CLEMENT NICORY.

INSTITUTE OF MEDICAL PSYCHOLOGY

To the Editor of THE LANCET

SIR,—May I correct one point which appears, perhaps as a printing error, in your report on Dr. Gillespie's speech on the Children's Act, on page 1049 of your issue of Nov. 4th? The Institute of Medical Psychology has in fact no whole-time medical officer nor any salaried doctors. Excluding the post-graduate students, it has some fifty doctors working as members of the full staff or as clinical assistants and they are all of them of necessity part-time. The difficulty of providing more treatment for cases from the courts in addition to the consultation services which the Institute already arranges is entirely a financial one. The waiting-list of ordinary non-delinquent patients is long and difficult to work through. I am, Sir, yours faithfully,

J. R. REES,
Deputy Director, The Institute of Medical Psychology.

Torrington-place, W.C., Nov. 7th, 1933.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICES

Jack, D. B., to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS

Col. N. J. C. Rutherford, late R.A.M.C., retd., relinquishes his appointment as Med. Offr., The Tower of London, and is succeeded by Lt.-Col. E. T. Potts, R.A.M.C., retd.

Maj. J. A. Manifold to be Lt.-Col.

Capt. R. J. Rosie is secd. for serv. with the Egyptian Army.

TERRITORIAL ARMY

Lt. H. C. M. Williams to be Capt.

H. R. Cara (late Cadet, Liverpool Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

INDIAN MEDICAL SERVICE

Capt. C. R. Henderson to be Maj.

Capt. J. M. Wilder to be Maj. (prov.).

ROYAL AIR FORCE

Flight Lt. J. D. Driberg relinquishes his commission on completion of service.

COLONIAL MEDICAL SERVICES

Dr. R. P. Crawford has been promoted to Senior Medical Officer, Nigeria, and Dr. P. S. Selwyn Clarke, Deputy Director of the Health Service, Gold Coast.

DEATHS IN THE SERVICES

Col. George Arthur Theodore Bray, D.S.O., R.A.M.C. (retd.), who died on Oct. 30th, aged 69, entered the medical service of the army with the rank of Surgeon in 1890, two years after taking the conjoint diplomas of the Royal Colleges. He served with the Nile Expedition of 1898, and was present at the battle of Khartoum (mentioned in despatches and medal). In the South African war of 1899–1902 he took part in the operations in the Orange River Colony and in Cape Colony (Queen's medal with two clasps and King's medal with two clasps). In the late war he served both in France and in Palestine, where he was Assistant Director of Medical Services, and was present at Jaffa and the capture of Jerusalem (mentioned in Despatches and D.S.O.). Col. Bray married in 1905 Angela Mary, daughter of Dr. Thomas Laffan, of Cashel, Ireland, who survives him with one son and two daughters. He reached the rank of Major in 1902, and of Lt.-Col. in 1912. He retired in 1919.

MENTAL HEALTH CONFERENCE:—The third biennial conference on mental health which has been arranged by the National Council for Mental Hygiene will take place from Nov. 22nd–24th at the Caxton Hall, Westminster, S.W. The special session for medical magistrates, to be held on Nov. 25th, at 10.30 A.M., will be open to all medical men and women on presentation of a visiting card. The secretary of the council may be addressed at 78, Chandos House, Palmer-street, London, S.W. 1.

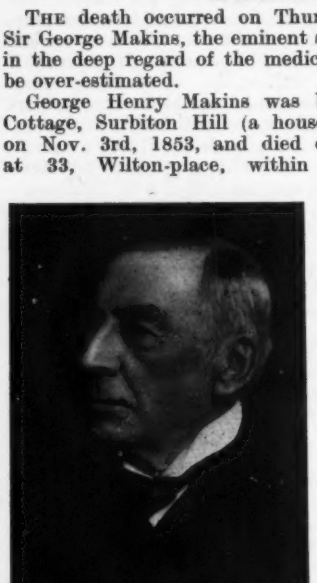
OBITUARY

SIR GEORGE MAKINS, G.C.M.G., C.B.

LATE PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

THE death occurred on Thursday, Nov. 2nd, of Sir George Makins, the eminent surgeon, whose place in the deep regard of the medical profession cannot be over-estimated.

George Henry Makins was born at Harrington Cottage, Surbiton Hill (a house that still stands), on Nov. 3rd, 1853, and died on Nov. 2nd, 1933, at 33, Wilton-place, within a few hours of his eightieth birthday. His grandfather was a junior official at the Treasury and died young from phthisis. His father, George Hogarth Makins, received a medical education at King's College and at St. George's Hospital, but devoted himself to the study of chemistry and more especially to metallurgy. He became an authority on the assay of gold, in connexion with the opening up of the new goldfields in Australia.



SIR GEORGE MAKINS
[Photograph by Russell

Makins, a delicate child, was first educated at small private schools, and then at the King's School, Gloucester, until the age of 15. He then studied for a year in his father's private laboratory, and at his own wish decided on a medical career in the face of some parental opposition. In 1871 he entered St. Thomas's Hospital, partly because of its convenience of access from Walton-on-Thames, where the Makins family were residing, and partly because he was attracted by the splendid appearance of the new hospital then only recently opened. He qualified as M.R.C.S., L.S.A. in 1875, and L.R.C.P. in the following year, and held the appointments of house physician and house surgeon in consecutive years. In 1878 he took the diploma of F.R.C.S., and thereafter pursued post-graduate studies in Vienna and Halle until his appointment as resident surgeon at St. Thomas's. This post he held for three years, when he became surgical registrar, and in 1886 was elected assistant surgeon and demonstrator of anatomy in the medical school. He was already well known to many leaders of the profession at home and abroad, for he had acted as assistant to Sir William MacCormac, who was secretary-general of the famous International Medical Congress which assembled in London in 1882. Makins's sojourn on the continent had been suggested to him by Sir William MacCormac as likely to be valuable to him in view of the coming meeting. And so it proved, for it was generally allowed that the great success of the Congress from the organising and secretarial aspect was largely due to Makins's unremitting labours and pleasing personality. His interest in these international movements never abated, and at the International Congress of Medicine held in London in 1913 he played an important part in the organisation of the meeting, while throughout his life he maintained friendly relations with many surgeons of other countries. Thus Makins came on to the staff of St. Thomas's with the perfect background. He had held all the preliminary appointments in succession and with general approval, and he soon justified the promotion. His colleagues found in him a wise consultant, and he became well known as a reliable operator, thorough in his work, who never sacrificed skill to speed. He continued while assistant surgeon to act as lecturer in anatomy, while through his general knowledge of the affairs of the hospital and the needs of the students he was able to suggest to the authorities on many occasions valuable innovations in the working. He became an admirable dean of the school.

Makins's long and intimate association with military medicine began at the outbreak of the South African war, when he went out to the seat of hostilities with Sir William MacCormac, who was appointed "Government consulting surgeon with the field force," and whom he assisted, with the rank of consulting surgeon, both at the front and in the inspection of the hospitals in Natal and Cape Colony. Valuable notes of their work were contributed to THE LANCET in a series of articles, while Makins summarised his own experiences in a volume which was mainly a study of the nature and effects of injuries produced by bullets of small calibre. The general trend of his observations showed that the increased range of fire of the weapons of the time, while it augmented the number of wounded, caused the individual results to be far less fatal than in previous wars, for so relatively large a proportion of the injuries was localised to individual structures, while a hopeful view of trunk and visceral injuries could be taken. For his services in the South African war he was appointed C.B.

Throughout his life Makins did much work outside his special duties as a surgeon to a great hospital. Not only did he teach anatomy, first as a demonstrator and then as lecturer in the medical school, but he also was early engaged in research in experimental pathology in association with C. S. Roy and Klein at the Brown Institution. This, it must be remembered, was at a time when experimental research work was only pursued with difficulty if not with active opposition, and Makins's association with research was one of many illustrations of the wide range of his outlook. It was this width of sympathy that made his so prominent a voice on the Council of the British Red Cross, on the governing body of the Imperial Cancer Research Fund, and on the distribution committee of the Metropolitan Hospital Sunday Fund. At this last he rendered valuable service to the maintenance of the voluntary principle in the management of the hospitals of this country, a principle that was very near his heart, and one to which he gave unwavering support, especially in these later years when other methods of hospital management and maintenance have come to the fore. The development of post-graduate teaching in London was also a matter to which he gave much time and thought, while he was closely interested in furthering the interests of the nursing profession, both in connexion with the Nightingale School and as a civilian member of Queen Alexandra's Imperial Nursing Board. This summary shows the extent and variety of the services he rendered right up to the end of his life for the relief of human suffering

both in peace and in war; it shows the manner in which he acted as a most valuable link between the civil medical profession on the one hand and the medical men serving in the naval and army medical services on the other.

The outbreak of the European war found him one of the busiest surgeons in London, but from the earliest hour he gave up all to the national claims. Throughout the struggle he was consulting surgeon to the British Expeditionary Force, when his past experience in South Africa, his range of professional accomplishments, and his powers of organisation were throughout different spheres recognised on all hands. As a consultant in the field, his advice and experience as a military surgeon were highly valued by all medical officers, and notwithstanding the great pressure of the duties in France he was able to carry to a successful conclusion a remarkable piece of research work on the wounds of blood-vessels, published as a separate work, and forming a very complete and valuable monograph on the subject. Further, he organised a very complete investigation at Etaples on the value of the treatment of gunshot wounds by the Carrel-Dakin method. This prolonged and thorough investigation well illustrates his profound interest in the progress of surgery and his capacity for furthering it. He was as well known in the Army Medical Service as in civil life, and not only to the wounded who had benefited by his advice and skill, but also to the higher authorities of the Army, who not infrequently consulted him on matters affecting the Service as a whole; and moreover he examined for years the candidates for commissions in the A.M.S. and in the Naval Medical Service. In 1915 he was appointed K.C.M.G. In 1917–18 he proceeded to India, at the request of the Government, as chairman of a committee appointed to investigate and report on the condition and equipment of military hospitals in India. This was a most extensive inquiry, involving a very large amount of work and much travelling over a great part of India, and resulted in a valuable report for which he received a personal letter of thanks from the viceroy and was awarded the G.C.M.G.

At the Royal College of Surgeons he was an examiner, member of council, and an exceptionally capable president, who not only, by his urbanity and dignity, did much to maintain the prestige of the College, but in addition assisted to develop the Royal College's great museum by the part he took in forming the now well-known "war collection," illustrating the morbid anatomy of gunshot wounds in the war. He was a considerable contributor to medical literature. In addition to the volumes already mentioned, he wrote at different times in his career the articles on thrombosis, embolism, phlebitis, and surgical tuberculosis in Heath's "Dictionary of Medicine," and the articles on rickets, diseases due to microbic infection, and to parasites in Treves's "System of Surgery"; in each case his wide personal knowledge led him to give a practical bearing to his teaching, his association with the Evelina Hospital for Sick Children yielding him often special experience to draw upon.

In 1885 Makins married Mrs. Fellowes, the widow of General Fellowes and the daughter of General Kirkland. This very gifted lady had engaged in nursing the wounded during the Egyptian war, and later became the sister-in-charge of Leopold ward at St. Thomas's Hospital, having intended after the death of General Fellowes to devote her life to nursing, under the ægis of Miss Florence Nightingale, who had expressed the hope that Mrs. Fellowes should ultimately take her place in the nursing world. The marriage was an ideal one and they formed a most devoted couple, the wife entering into all her husband's work so far as this was possible. Thus when he went to South Africa she followed as soon as possible, and whilst he fulfilled his duties as a surgeon, she nursed in or administered a hospital, and was awarded the R.R.C. for her work. She joined her husband in his relaxations as well as in his work, whether these took the form of Alpine climbing, gardening, or the playing of quartets, to all of which Makins was devoted. Fishing and shooting—both of which appealed to Makins—did not, however, have the same charm for her, though she accompanied him on his fishing expeditions to Norway. Lady Makins died in 1931 after a short illness, and sometimes Makins used to say that his life really ended then, although he ever maintained a brave outlook, and shortly before his own death told a friend that he looked back on a very happy life.

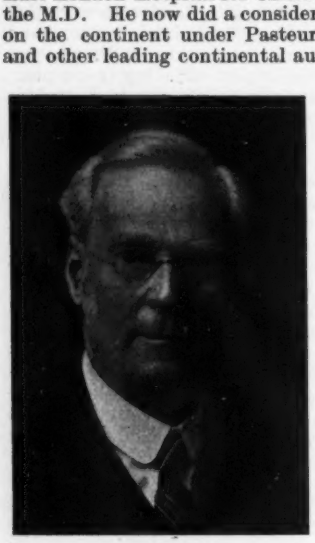
In the death of Sir George Makins the profession of medicine has to mourn the loss of a man who deservedly occupied a unique position in our profession owing not merely to his solid achievements in the realm of surgery, as a practical and wise surgeon and teacher, but more especially owing to his high character, integrity, and selfless devotion to the particular duty he had in hand at any one moment. It is given to few men to inspire in others the affectionate regard and esteem that was the special characteristic of Makins, experienced by those who came in contact with him, whether as patients, pupils, colleagues, or friends. All felt in consulting him, whether professionally or for advice in the wider field of human conduct, that not only was the advice given wise and shrewd, but that it was always given absolutely without any thought of self, and was ever guided by the highest motives as to what constituted right and wrong. Makins always inspired confidence owing to this outstanding feature of his character, and those who knew him best were not only fully aware of this but also of his innate modesty, so that sometimes he did not receive the appreciation that was his due. Such occasions were met by him with that quiet smile and peculiar glance of the eyes that meant much in his refined, expressive, and striking face, and that so often took the place of words. He was restrained and reticent in the criticism of others, but no man had a greater contempt for mean actions, and he was singularly shrewd in his perception of such things, although his kind nature made him chary of utterance. If, however, the occasion seemed to him to demand it, he was not slow to take action, and such action rarely failed to achieve the desired result, notwithstanding the quiet manner in which it was done. Under the quiet, truly friendly, and genial manner there was a firmness of character that always remained unshaken and prepared for effective action when the real necessity arose.

FREDERICK JOSEPH WALDO, M.D. Camb., D.P.H.

LATE CORONER FOR THE CITY OF LONDON

THE death occurred on Nov. 2nd of Dr. F. J. Waldo at his house in London at the age of 81. He was for a long period the coroner for the City of London and Southwark, and in the conduct of his public business won high esteem for his energy and efficiency. The son of Bristol parents, he was born in 1852 and educated at Clifton College, whence he proceeded to St. John's College, Cambridge, where he had a successful career as a student. He completed

his medical course at St. Bartholomew's Hospital, and graduated as M.B. Camb. in 1880. He held the appointment of house physician at St. Bartholomew's Hospital, and house appointments also at the City of London Hospital for Diseases of the Chest and the East London Hospital for Children. In 1884 he took the M.D. He now did a considerable amount of work on the continent under Pasteur, Koch, Pettenkofer, and other leading continental authorities, and to this equipment he added the D.P.H. Eng. Conj. Bd. His first inclination in practice was towards gynæcology and he became assistant physician to the Chelsea Hospital for Women, but in 1896 he was called to the Bar, and soon after was appointed the first medical officer of health to the Inner and Middle Temples, holding also similar positions in the parish of St. George the Martyr, Southwark. Thenceforward he turned to public health; at his old hospital he became tutor in the subject, and in 1901 was appointed coroner to the City of London, a post which he held for over 30 years, only retiring in 1932.



DR. WALDO

[Photograph by Elliott and Fry

In discharge of his duties as coroner he displayed efficiency and a resolute intention to maintain the dignity of the ancient office of coroner with all its privileges, attaching special importance to his duty in the City of London of holding inquests after fires. In his breezy addresses to juries he said many wise things and showed himself particularly fearless of criticism, with the consequence that probably the obiter dicta of no coroner have been so frequently reported in the public press. In August last a protracted trial ended in the conviction of a gang of fire insurance swindlers, the circumstances in many ways justifying Waldo's views that the survival in the City of London of the responsibility upon the coroner to hold inquiry in other than fatal fires was one which might well be laid again upon all coroners. It was Dr. Waldo's practice to call accountants and fire experts to give evidence. The proceedings in his court usefully drew attention to dangerous structures, and the lack of proper fire escapes and appliances, while his records showed, among other things, that in 25 fire inquests held in the City in the year 1921, in 11 a verdict of arson was returned. One such inquest revealed the work of an alien who was afterwards convicted and deported. In another case the coroner himself, on a prompt personal visit to the scene, discovered an empty petrol can. On this occasion Leopold Harris, one of the gang recently convicted, was closely examined, and it was decided to watch his future association with such matters. Waldo's action was a direct antecedent to the conviction of Harris's criminal gang.

Waldo was selected as Milroy lecturer of the Royal College of Physicians of London in 1900, when he chose for his subject Summer Diarrhœa in Children; the lectures showed that he had made exhaustive inquiry into this fruitful source of infantile mortality in special relation to prevention in urban communities. His professional position and the estimate of him by his colleagues was reflected in his numerous public appointments. He had been hon. secretary of the Coroners Society for England and Wales, president of the London Coroners Association, a special lecturer on medical jurisprudence to the Council of Legal Education, and Master of the Plumbers' Company, of which corporation he wrote a short history. There came also from his pen, in addition to his official statements as coroner, pamphlets upon medico-legal cases, and upon the principles of hygiene and food storage, and an interesting report upon bakehouses.

Dr. Waldo married in 1900 Marion, daughter of the Rev. R. B. Lawson Exton, by whom he had three daughters, who, with his widow, survive him.

EMILE ROUX

THE death of Prof. Roux on Nov. 3rd, less than a week after the death of Calmette, leaves the world in general and the Pasteur Institute in particular much poorer. Roux, the director of the institute, had been suffering for many years from a very chronic form of pulmonary tuberculosis which greatly hampered, though it did not arrest, his activities. Calmette, the assistant director of the institute, ten years younger than Roux, was the robust administrator, taking many a burden off his chief's shoulders. A hæmoptysis last summer filched still a little more of Roux's vitality, and the last few months of his life were dragged through in a state of profound physical debility. But he was still mentally alert and though confined to his bed in the hospital which forms part of the Pasteur Institute, he continued to receive friends and read papers till a few hours before his death. He was visited daily by Calmette in, apparently, the rudest of health. At one time it seemed only a matter of hours before Roux would pass away, and Calmette had prepared an obituary notice of him for *Figaro* which has now appeared, the appreciation of one dead man by another.

PROF. ROUX

[Photograph by E. C. Templier, Paris

Pierre Paul Emile Roux was born on Dec. 17th, 1853, at Confolens, Charente, where his boyhood was spent. His father was the principal of the school he attended. His medical studies were begun at Clermont-Ferrand, where he had the good fortune to attract the attention of Duclaux, the distinguished chemist, and when Duclaux was invited to fill a chair at the Agricultural Institute in Paris, he took Roux with him. On a fateful afternoon in 1878 Duclaux

introduced him to Pasteur, whose devoted disciple he remained for life. Roux worked under Duclaux and Pasteur, and in 1883 he published a study on rabies largely inspired by the latter. In the following years a series of communications were made by the two to the Academy of Sciences, and in 1895, on the death of Pasteur, Roux was appointed assistant director of the Pasteur Institute. In 1904 he succeeded Duclaux as director and more than any other upheld the Pasteur tradition.

Roux's contributions to science are far-reaching, for they include not only what he did himself, but what he inspired others to do. Like Pasteur, he had the gift of surrounding himself with brilliant men and of drawing out their best qualities. Much of Pasteur's work on the attenuation of the virulence of certain germs, on chicken cholera, and on the vaccination of sheep and cattle against anthrax was supplemented and amplified by Roux. In 1883 he went to Egypt with Nocard, Straus, and Thuillier to study Asiatic cholera. On his return he worked with Pasteur on rabies; he investigated the properties of tuberculin with Nocard, those of diphtheria with Yersin, those of tetanus with Vaillard, those of the pleuro-pneumonia of cattle with Nocard and Dujardin-Beaumetz. In other researches he was associated with Metchnikoff. Roux's courses in bacteriology, which he began in 1889, and which were uninterrupted except for the war years, drew pupils from every quarter of the world; more than 3000 students of all ages and nationalities are said to have attended them.

His work on diphtheria may or may not have been Roux's greatest contribution to medicine, but it is best known. His investigations with Yersin into the nature of diphtheria toxin were the starting-point of Behring's work which led to the discovery of antitoxin. Roux at once grasped the significance of the new discovery and he set out, aided by Nocard, and two young men, Louis Martin and Chaillou—then hospital interns—to explore the therapeutic possibilities of antitoxin. It was a question of providing an antitoxin safe enough for use on human beings. The horse having been found to be a suitable source of supply, Roux and his collaborators worked out the mode of preparation and dosage of the new remedy. His famous communication on this subject to the International Congress of Medicine at Budapest in 1894, claiming antitoxin as of value both as prophylactic and remedy, was based on the observation of 300 cases in the wards of a children's hospital. It was one of life's little ironies that a man of Roux's temperament should be responsible for so sensational an advance in medicine. He had always detested publicity, but here he was announcing a discovery the import of which was grasped at once in the streets. The possibility of diphtheria being rendered harmless, if not banished, appealed to the imagination of a world which with impulsive enthusiasm wanted to buy its freedom from this disease forthwith. *Figaro* opened a public subscription, and in a few weeks more than a million francs had rolled in; they were devoted to the preparation and distribution of antitoxin by the Pasteur Institute. The new remedy, which had hitherto been limited to a few cases kept under close observation, was now distributed widely and with results with which medicine is now familiar.

Serious illness in 1900 and thereafter was a check on Roux's energies and he lived to direct the labours of others rather than to toil himself. No one will ever know how great a part he played in any piece of research, for he would not let his name be attached to it, alone or in conjunction with that of some junior. It used to be said that only Calmette knew, and Calmette is no more. Roux set a standard of selflessness of which few are capable.

MEDICAL NEWS

University of Oxford

The Theodore Williams scholarship in physiology has been awarded to David Whitteridge.

University of Cambridge

On Nov. 4th the following degrees were conferred:—

M.D.—N. L. White, H. F. Griffiths, and H. B. Stallard.
M.B. and B.Chir.—L. K. Wills, and A. G. Cross.
M.B.—O. A. Trowell.

English Conjoint Examining Board

At the final examination held from Oct. 2nd to 24th the following candidates were approved in the subjects indicated below, but are not yet eligible for diplomas:—

Pathology.—S. H. Alavi, St. Thos.; N. Angel, Birmingham; Margaret D. Baber, Univ. Coll.; H. H. Bayley, Camb. and King's Coll.; C. H. T. Bond, Camb. and St. Mary's; J. Boyle, St. Mary's; J. C. Buckley, Camb. and St. Thos.; E. J. Bury, Camb. and St. Mary's; N. A. Buxton, Camb. and Middx.; A. M. G. Campbell, Oxford and Guy's; A. M. Chapnick, Westminster; Dora J. A. Clark, Royal Free; S. G. Clayton, King's Coll.; H. M. Clegg, Leeds; W. B. Clegg, Guy's; L. A. Collins, Camb. and Charing Cross; A. N. F. Critchley, St. George's; G. B. Davis, King's Coll.; D. W. A. De Gazon, Univ. Coll.; A. R. O. Denton, Guy's; A. M. Desmond, London; J. R. Dickinson, Camb. and Guy's; Bessie Dodd, Liverpool; T. S. Eddy, Guy's; K. C. Eden, Univ. Coll.; E. A. Evans, Camb. and King's Coll.; C. S. Ford, Middx.; A. F. Fowler, St. Thos.; A. H. T. F. Fullerton, Camb. and Birmingham; L. B. Furber, St. Bart.'s; R. H. Gardiner, Oxford and King's Coll.; D. J. Gilbert and R. J. Gilpin, King's Coll.; G. B. Grayling, St. George's; C. E. Greenwood, Oxford and King's Coll.; T. F. Greenwood, Middx.; P. Grugeon, King's Coll.; H. A. Hamilton, Camb. and Guy's; M. Hamilton, Univ. Coll.; L. D. Harris, St. Mary's; Violet C. Hart, Royal Free; R. R. Henderson, St. Thos.; G. T. Hindley, Camb. and St. Bart.'s; R. E. Hirson, Manchester; I. W. Hockley, St. Thos.; A. G. Hounslow, Univ. Coll.; N. G. Hulbert, Camb. and St. Bart.'s; A. H. Hunt, Oxford and St. Bart.'s; R. Hussain, Patna and St. Bart.'s; J. E. Jameson, St. Thos.; C. C. Jeffery, London; J. R. R. Jenkins, St. Bart.'s; E. I. Jones, King's Coll.; H. W. E. Jones, St. Thos.; P. G. C. Jones, Guy's; K. C. Kershaw and Fredk H. Knight, Manchester; J. L. Lanceley, Liverpool; A. M. Lester, King's Coll.; T. Levitt, Middx.; L. Lurie, London; A. J. McCall, Liverpool; D. de la C. MacCarthy, St. Bart.'s; W. M. Macleod, St. Thos.; W. G. Mills, Camb. and St. Thos.; R. B. Morton, St. Thos.; E. J. Moynahan, Univ. Coll.; G. A. Myers, Otago; A. Nagi, Royal Free; M. M. Osher, King's Coll.; C. G. Pantin, Camb. and Guy's; W. H. A. Picton, Oxford and King's Coll.; A. H. Pirie, Camb. and St. Bart.'s; R. H. Purnell, St. Bart.'s; E. G. Pyne, Camb. and Charing Cross; M. S. M. Rayner, Camb. and St. Thos.; S. A. Razvi, Birmingham; K. B. Rogers, St. Mary's; N. S. Sablin, St. Bart.'s; H. S. K. Sainsbury, London; S. R. Saunders, Cardiff; R. Sollenberger, St. Mary's; R. Spencer, Manchester; L. W. Spratt, Camb. and St. Thos.; A. F. Stallard, Camb. and St. Bart.'s; E. Starling, Oxford and St. Thos.; J. R. St. G. Stead, London; A. B. Stenhouse, Oxford and St. Thos.; K. R. Tattersall, St. Thos.; J. C. Thomas, Univ. Coll.; B. Thorne Thorne, Camb. and St. Bart.'s; R. H. A. Turner, Camb. and Westminster; G. R. Usmar, Sheffield and St. Bart.'s; J. K. B. Waddington, Liverpool; W. Waks, St. Bart.'s; J. T. Waldie, Guy's; J. H. Walters, Camb. and King's Coll.; W. F. Walton, Camb. and St. Thos.; B. Weiner, St. Bart.'s; Elizabeth B. White, Royal Free; Margaret C. Winter, Liverpool; and Brenda Winterton, Royal Free.

Medicine.—Winifred L. Acraman, Cardiff; T. M. Bell, Camb. and Charing Cross; C. J. F. Blumenthal, Guy's; R. Carpenter, St. Bart.'s; A. S. Cheong, Singapore and St. Mary's; L. A. Collins, Camb. and Charing Cross; Beryl D. Corner, Royal Free; Margaret C. Cox, Royal Free and West London; F. H. Culshaw, Camb. and St. Bart.'s; H. H. Davies, St. Bart.'s; F. W. Dunn, Charing Cross; Katharine E. M. Dunne, Camb. and Leeds; D. G. F. Edward, St. Bart.'s; E. H. Evison, Manchester; H. D. Fairman, London; W. H. Fernando, Ceylon; A. V. Griffiths, Cardiff; J. R. Hill, St. Bart.'s; D. A. Hovenden, St. Thos.; T. H. Howell and J. Hughes, Camb. and St. Bart.'s; R. Hussain, Patna and St. Bart.'s; D. M. Jones and E. G. Jones, St. Bart.'s; E. I. Jones, J. G. Jones, and G. A. Kiloh, King's Coll.; A. P. R. Lewis, Westminster; Christia F. Lucas, Birmingham; J. B. H. McArthur and E. A. Mayston, Guy's; D. J. M. Moynahan, St. Bart.'s; R. V. N. Nayudu, Madras and London; G. P. Neogy, London; W. S. Noble, Guy's; F. W. M. Plant, Birmingham; T. R. F. Raw, Guy's; D. C. Reavell, St. Bart.'s; J. D. Richardson, King's Coll.; A. T. Roden, St. Bart.'s; S. A. W. Rushbrooke, Guy's; R. T. Rushton, Leeds; B. J. Sanger, London; A. Smith, Leeds; M. C. L. Smith, St. Bart.'s; D. L. M. Stewart, King's Coll.; J. S. F. Sutton, Guy's; R. J. C. Sutton, St. Bart.'s; N. Thomas, Royal Free; C. R. H. Weekes, St. Bart.'s; J. L.

Whatley, Birmingham; M. W. Williams, Univ. Coll.; and Sylvia V. F. Wolfe, Royal Free.

Surgery.—A. S. Amsden, Guy's; Louie M. M. Beadnell, Univ. Coll.; R. H. R. Belsey and T. A. Best, St. Thos.; I. S. Bhalla, Univ. Coll.; Mary A. M. Bigby, Royal Free; R. A. Binning, Camb. and St. George's; L. C. Bousfield, Middx.; J. Boyle, St. Mary's; Edith J. R. Browne, Royal Free; E. M. Buzzard, Oxford and St. Thos.; K. H. Clark, St. Mary's; C. J. Cobbe, St. Thos.; D. L. L. Davies, St. Bart.'s; Enid S. Davies, Univ. Coll.; Ruth C. Easterling, King's Coll.; W. E. F. Evans, St. Bart.'s; Constance E. Field, Univ. Coll.; P. A. Flood, Camb. and St. Thos.; W. T. J. Fowler, Guy's; J. A. C. Franklin, St. Thos.; H. E. D. Gale, St. Bart.'s; S. S. B. Gilder, London; H. W. Gordon, Wits'rand and Lond.; R. I. N. Greaves, St. Mary's; T. F. Greenwood and I. H. Griffiths, Middx.; A. E. M. Hartley, Camb. and St. Mary's; E. B. Harvey, St. Thos.; W. F. Harvey, London; F. S. M. Heggs, St. Thos.; M. H. Hosny, Birmingham; T. E. Howell, Guy's; J. Hughes, Camb. and St. Bart.'s; J. A. C. Hunter, Guy's; J. R. Hutcheon, London; W. L. Isaac, R. W. John, and I. R. Jones, Cardiff; I. D. Jones, Middx.; J. E. V. Jones, Camb. and St. Thos.; L. E. Jones, St. Thos.; W. M. P. Jones, Cardiff; H. R. Kasday, Middx.; L. M. Kelly, St. Thos.; M. A. Khan, Hyderabad and West Lond.; J. R. Kingdon, St. Bart.'s; J. T. H. Knight, London; J. W. J. Knowles, St. Thos.; Mildred G. Latham, Royal Free; L. F. E. Lewis, Manchester; K. Lumsden, Camb. and St. Bart.'s; L. Lurie, London; J. M. McArthur and J. W. Mansie, Guy's; E. H. Markby, Leeds; J. D. Martin-Jones, St. Bart.'s; R. Mascarenhas, Guy's; H. B. May, Camb. and London; R. A. Morea, London; R. B. Morton, St. Thos.; L. O. Mountford, Camb. and London; J. H. Neal, Middx.; G. P. Neogy, London; P. H. Newman, Middx.; N. C. Oswald, Camb. and Charing Cross; S. Paletz, St. George's; J. E. G. Pearson, Oxford and Middx.; W. H. Phillipps, Camb. and St. Thos.; D. S. Piper, Guy's; A. H. Pirie, Camb. and St. Bart.'s; J. W. Rhys, Guy's; K. B. Rogers, St. Mary's; L. M. Rouillard, St. Thos.; P. H. Sandifer, Middx.; R. S. F. Schilling, St. Thos.; K. G. Seager, St. Mary's; D. J. Sheehan, St. Bart.'s; D. B. Shulman, St. Mary's; H. G. Silvester, Univ. Coll.; L. Sobiya, Guy's; E. Starling, Oxford and St. Thos.; K. F. Stephens, St. Bart.'s; S. Sunkavally, Madras and London; R. E. Thomas, Univ. Coll.; G. C. Tooth, St. Bart.'s; P. A. Wilkinson, Guy's; W. Wilson, Manchester; Brenda Winterton, Royal Free; and B. L. E. Wong, Guy's.

Midwifery.—Joyce M. Ackland, Royal Free; R. A. Andrews, Camb. and Guy's; M. Appelman, St. Bart.'s; R. C. B. Barbor, Camb. and St. Thos.; T. L. Barbour, Guy's; C. Bard, London; C. H. D. Bartley, Camb. and St. Thos.; G. Bates, Birmingham; R. L. Benison, Camb. and St. Bart.'s; P. D. Bhatt, London; D. Bickler, Leeds; R. A. Binning, Camb. and St. George's; E. W. Bintcliffe, St. Bart.'s; R. H. Blazeby, Guy's; C. H. Bliss, St. Thos.; T. A. Blyton, Cardiff; C. H. T. Bond, Camb. and St. Mary's; A. C. E. Breach, St. Thos.; N. P. Brown, Camb. and Middx.; E. J. Bury, Camb. and St. Mary's; N. A. Buxton, Camb. and Middx.; H. Cameron, Guy's; R. F. Clarke, St. Bart.'s; M. C. Condillac, Madras and Westminster; Beryl D. Corner, Royal Free; R. F. Courtin and J. O. Creighton, St. Thos.; E. A. Danino, St. Bart.'s; D. R. Davies, Univ. Coll.; A. J. S. De Freitas, St. Bart.'s; G. M. Denning, Bristol and St. Mary's; Hilda S. F. De Peyer, King's Coll.; A. M. Desmond, London; Dorothy S. R. Drew, Royal Free; G. G. W. Elwell, Camb. and Univ. Coll.; H. J. Fenn, King's Coll.; H. P. Fernandes, St. Bart.'s; A. B. R. Finn, St. Thos.; J. M. Fleming, London; I. C. Fletcher, Camb. and Middx.; C. S. Ford, Middx.; J. F. A. Forster, Guy's; P. S. Fox, Leeds; C. B. Franklin, St. Bart.'s; R. H. Gardiner, Oxford and King's Coll.; K. D. Gibson, Camb. and St. George's; S. W. Gillman, Univ. Coll.; R. J. Gilpin, King's Coll.; J. G. A. Gilruth, Univ. Coll.; S. Ginsberg and A. J. Glazebrook, St. George's; Bessie W. Goodwill, Birmingham; M. E. Gordon, Cardiff; C. E. Greenwood, Oxford and King's Coll.; P. R. Greeves, Middx.; G. D. Hadley, Camb. and Middx.; J. A. G. Hair, Univ. Coll.; Irene G. Hamilton, Bristol; M. Hamilton, Univ. Coll.; W. H. Hamilton, Dublin and Guy's; W. H. C. M. Hamilton, St. Thos.; Barbara D. F. Hay-Cooper, Royal Free; J. C. Henry and R. C. Hill, Guy's; R. D. Holloway, Camb. and St. George's; A. G. Hounslow, Univ. Coll.; G. B. Hughes and J. R. Hutcheon, London; J. C. Hutchinson, Leeds; Elizabeth M. James, Royal Free; C. C. Jeffery, London; Joyce B. Jewson, Royal Free; D. R. Jones, Cardiff; F. A. Jones, St. Bart.'s; J. T. H. Knight, London; M. Krone, Middx.; Joan F. M. E. Lamplugh, Birmingham; K. A. Latter, St. Bart.'s; J. A. Lewis, St. George's; G. M. Lloyd, St. Bart.'s; A. T. Marrable, St. Thos.; L. C. Martin, Middx.; H. B. May, Camb. and Lond.; S. G. Mayer, London; W. G. Mills, Camb. and St. Thos.; C. Mitchell, Guy's; S. G. Mohler, St. Mary's; J. N. Morris, Univ. Coll.; R. S. Morris, Camb. and St. Thos.; Barbara G. Morton, Royal Free; L. O. Mountford, Camb. and London; S. Mullick, St. Bart.'s; J. T. Murray Aynsley, Camb. and St. Thos.; D. G. Oehlers, London; M. M. Osher, King's Coll.; H. Oweiss, Royal Free; S. H. Pearse, St. Thos.; G. W. V. Pegge, St. Mary's; R. Peters and J. Phillips, Univ. Coll.; R. B. Phillips, Edinburgh and Vienna; R. E. A. Price, London; E. J. Pryn, Guy's; H. S. Rassim, St. Bart.'s; T. A. Ratcliffe, Camb. and St. Thos.; C. Reburn, St. Mary's; S. A. W. Rushbrooke, Guy's; B. D. Sachdeva, Punjab and Guy's; H. V. Sansom, St. Bart.'s; S. R. Saunders, Cardiff; S. G. Shippard, King's Coll.; J. A. Sidebottom, Guy's; G. E. T. Soden, St. Bart.'s; J. R. St. G. Stead, London; R. H. Taylor, Camb. and St. Mary's; Elisabeth J. M. Thomas, Univ. Coll.; Nest Thomas, Royal Free; A. S. Till, Camb. and Middx.; R. H. A. Turner, Camb. and Westminster; R. J. Vakil, St. Thos.; P. A. Walford and W. F. Walton, Camb. and St. Thos.; J. D. S. Watling, Univ. Coll.; B. Weiner, St. Bart.'s; C. T. H. Whiteside, St. Thos.; M. Williams, Camb. and St. George's; W. C. Winterbottom, St. Mary's; Sylvia V. F. Wolfe and Audrey R. Wood, Royal Free; G. M. Woolford and R. F. Wyatt, St. Thos.

Royal College of Surgeons of Edinburgh

The following candidates having passed the final dental examinations have been granted the diploma of L.D.S. R.C.S. Edin.:—

C. P. Moore, B. R. Jennings, W. H. Suffield, G. W. Lager, F. H. Wilson, Edward Waddell, R. N. Fox, R. W. Plummer, R. H. Gardner, Gordon Bennett, A. E. Duvall, T. K. Cheok, C. E. Vincent-Jones, Heinrich Schirnding, J. N. McClarence, W. F. Finlayson, Mackay Campbell, and Edward Whyte.

London School of Hygiene and Tropical Medicine

The next series of eight lectures and demonstrations on tropical hygiene, which are intended for men and women outside the medical profession proceeding to the tropics, will be given by Lieut.-Colonel G. E. F. Stammers, from Dec. 4th to 13th. The synopsis may be had from the Secretary of the School, Keppel-street, Gower-street, W.C. 1.

British Health Resorts Association

The annual general meeting of this association will be held at the Institute of Hygiene, 28, Portland-place, London, W., at 4 P.M. to-day, Friday, Nov. 10th, when Lord Meston, chairman of the council of the association, will preside.

Pharmaceutical Society of Great Britain

The first evening meeting of the 1933–1934 series will be held in the society's house, 17, Bloomsbury-square, London, W.C., on Tuesday, Nov. 14th, at 8.30 P.M., when Prof. George Barger, F.R.S., professor of chemistry in relation to medicine in the University of Edinburgh, will give a lecture on ergot and ergotism.

Surgical Instrument Manufacturers' Association

The annual dinner of the association was held at the Criterion Restaurant on Oct. 20th, 1933, Mr. Patrick C. Maw presiding. In proposing "The Association," Sir William Wheeler said that there was no surgical operation, simple or grave, that could be performed with any hope of success unless the surgeon had the surgical instrument manufacturers at his back. It was their artistic productions that enabled the art of surgery to be carried out; these things made all the difference between suffering and relief, failure and success, life and death. It was most desirable for the surgeon and the instrument maker to work together as a team. Mr. Maw, in returning thanks, referred to the efforts the association was making to prevent the practice of quackery. Mr. H. Guy Drew proposed "The Guests" which was responded to by Dr. Robert Forbes, who welcomed, on behalf of the British Medical Association, the suggestion of opportunities for closer liaison between the medical profession and those who provided it with the apparatus, the appliances and tools. Sir Frederick Hobday added that the veterinary profession owed as much to the surgical instrument maker as did the human surgeon.

Appointments

BROWN, C. M., M.D., Ch.B. Glasg., D.P.H., has been appointed Medical Officer of Health, Dewsbury.

OWEN, DONALD U., M.D. Liverp., D.T.M., Hon. Physician to the Bootle General Hospital.

WHITAKER, P. H., M.B., Ch.B. Liverp., D.M.R.E., Hon. Assistant Radiologist to the Liverpool Royal Infirmary.

Certifying Surgeons under the Factory and Workshop Acts: MORRISON, R. G., L.R.C.P. Lond., M.R.C.S. (Duffield, Derby); CRAWHALL, T. L., L.R.C.P. Lond., M.R.C.S. (Watlington, Oxford).

Births, Marriages, and Deaths

BIRTHS

BAIN.—On Nov. 1st, at Straymede, Harrogate, the wife of Cyril Curtis Bain, M.D., of a son.

CRAWFORD.—At Nyaunghla, Upper Burma, on Oct. 8th, 1933, the wife of W. B. S. Crawford, M.B., B.Ch., of a daughter.

DEATHS

BALY.—On Oct. 31st, Arthur Lionel Baly, M.A. Cantab., M.R.C.S., L.R.C.P. Lond., Medical Superintendent of Lambeth Hospital for 22 years, aged 53.

HUTCHINSON.—On Oct. 4th, at Rochford Hospital, Dr. Harry Hutchinson, M.R.C.S., L.R.C.P., formerly of 218, Plashetgrove, East Ham, son of the late Henry Hutchinson, M.R.C.V.S., of Retford, and beloved uncle of Nurse Mary Hutchinson.

JONES.—On Nov. 2nd, at Tudor House, Hillcroft-crescent, Wembley Park, George David Edwards Jones, M.D., F.R.C.S., aged 65.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

PARLIAMENT

NOTES ON CURRENT TOPICS

Reassembly of Parliament

BOTH Houses of Parliament reassembled on Tuesday, Nov. 7th, after the summer recess. After certain outstanding business has been disposed of the present session will be concluded and the new session will be opened on Nov. 21st by the King in State.

Hospitals and Road Accidents

In the House of Lords on Tuesday, Nov. 7th, the MARQUESS OF LONDONDERRY moved the second reading of the Road and Rail Traffic Bill, which has already passed through the House of Commons. He said that while the Government did not claim that the proposals which they submitted in this measure represented a final solution of the difficult problems connected with the transport industry, they were confident that the Bill represented a substantial contribution to the advancement of public safety and convenience and to a better and more economical organisation of inland transport.

After further debate,

Lord LUKE raised the serious position in which many voluntary hospitals were placed by reason of the fact that they were called upon to treat large numbers of motor accidents on the roads. Owing to their accommodation being occupied with such cases, he said, local patients had to wait considerable periods for admission. The hospitals did not ask that motorists should pay anything towards the cost of their buildings or equipment; what they asked was that they should be paid their out-of-pocket expenses in relation to the treatment of road accident cases. At present hospitals were only able to obtain payment of a small proportion of their expenses in this respect. He did not believe that motorists, if they really understood the position, would like to see these poor hospitals continuing to play the Good Samaritan in this way. No Road Traffic Bill could be considered satisfactory unless it enabled the hospitals to get back their out-of-pocket expenses incurred in treating road accidents.

The Earl of PLYMOUTH, replying to the debate on behalf of the Government, said the question raised by Lord Luke in regard to the hospitals had been discussed on several occasions in their Lordships' House. He knew that the representations which Lord Luke had made were always in the mind of the Minister and what he had said would certainly receive consideration.

The Bill was read a second time.

HOUSE OF COMMONS

TUESDAY, NOV. 7TH

Out-Relief

Mr. LUNN asked the Minister of Health the total number of persons receiving out-relief in September, 1931, and at the latest possible date.—Mr. SHAKESPEARE (Parliamentary Secretary to the Ministry of Health) replied: The total number of persons (men, women and children) in receipt of out-relief in England and Wales (excluding persons in receipt of domiciliary medical relief only) on Saturday, Sept. 26th, 1931, was 786,771. The corresponding number on Saturday, Oct. 21st, 1933, was 1,106,871.

Slum Clearance

Mr. RHYS DAVIES asked the Minister of Health the number of local authorities that had submitted schemes for slum clearance and the number that had been approved by his department.—Mr. HICKS asked the Minister of Health what progress had been made in slum clearance.—Mr. SHAKESPEARE replied: My right hon. friend understands that the questions refer to the later stage of schemes included in resolutions and orders under the Housing Act, 1930, and not to the earlier stage of submitting programmes in response to my right hon. friend's circular of April 6th last. As to the former, up to Oct. 31st, 236 local authorities in England and Wales submitted to the Minister resolutions declaring 1,265 areas comprising 32,839 houses to be clearance areas; 878 Clearance and Compulsory Purchase Orders affecting 23,012 houses were submitted for confirmation and 519 orders made by 139 local authorities affecting 13,133 houses were confirmed: in addition 1,013 houses were purchased by local authorities for demolition without a Compulsory Purchase Order.

Vacancies

For further information refer to the advertisement columns

Bath, Royal United Hospital.—H.S., Out-patient and Cas. O. Each at rate of £150.
Bedford County Hospital.—Second H.S. At rate of £140.
Belgrave Hospital for Children, Clapham-road, S.W.—Asst. Physician. 50 gns.
Birmingham and Midland Hospital for Women.—Acting Hon. Surg. and Reg.
Birmingham, Queen's Hospital.—Res. Med. Reg. At rate of £200.
Bolton Royal Infirmary.—Three H.S.'s. Each £125.
Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £100.
Bristol University.—Chair of Anatomy.
Burton-on-Trent General Infirmary.—Cas. O. and H.P. £150.
Cancer Hospital, Fulham-road, S.W.—Res. M.O. £200.
Chelmsford and Essex Hospital and Dispensary.—Res. M.O. £150.
Chelsea Hospital for Women, Arthur-street, S.W.—Jun. H.S. At rate of £100.
Chester Royal Infirmary.—H.P. £150.
Chesterfield and North Derbyshire Royal Hospital.—Res. Surg. O. £300.
City of London Hospital for Diseases of Heart and Lungs, Victoria Park, E.—Asst. Surg.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Res. M.O. £250. Also H.P. At rate of £100.
City of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.
Devon County Council.—School Medical Inspector. £500.
Dewsbury and District General Infirmary.—Sen. H.S. £200.
Dorset County Council.—County M.O.H. £1100. Also Two Asst. M.O.'s. Each £500.
Essex County Council.—Asst. County M.O. and Deputy M.O.H. £700.
Exeter Royal Devon and Exeter Hospital.—Hon. M.O. to Radiological and Electrical Dept.
Fulham Hospital, St. Dunstan's-road, Hammersmith, W.—Res. Med. Supt. £1000.
Gloucester, Gloucestershire Royal Infirmary, &c.—Two H.S.'s. Each at rate of £150.
Great Yarmouth General Hospital.—H.S. £140.
Guildford, &c. Rural Districts.—M.O.H. £800.
Home Office, Whitehall, S.W.—Med. Inspector of Factories. £726.
Hull Royal Infirmary.—Cas. O. At rate of £150.
Ilford, King George Hospital.—Hon. Ophth. Surgeon.
Ilford, King George Hospital.—Res. M.O. £250.
Kettering and District General Hospital.—Res. M.O. At rate of £200.
Lambeth Hospital, Brook-street, Kennington.—Res. Med. Supt. £1400.
Lincoln, Bracebridge Mental Hospital.—Fourth Asst. M.O. £350.
Liverpool Radium Institute and Hospital for Cancer.—Two Hon. Surgeons and Hon. Gynæcologist.
Manchester, Christie Hospital and Holt Radium Institute.—Res. Radiological Asst. for X ray Dept. £275.
Manchester, Christie Hospital and Holt Radium Institutel—Res. Radiological Asst. £275.
Metropolitan Water Board, 173, Rosebery-avenue, E.C.—Director of Water Examinations. £2000.
Miller General Hospital, Greenwich-road, S.E.—Cas. O. and Out-patient Officer. Each at rate of £150. Also H.S. and H.P. Each at rate of £100.
New Zealand, Christchurch Hospital.—Asst. Pathologist. £600.
Northampton General Hospital.—H.S. and Cas. O. At rate of £150 and £120 respectively.
Prison Medical Service.—M.O. £505 7s.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Two Res. Anæsthetists. Each at rate of £100.
Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100. Also Clin. Asst. to Orthopædic Dept. 5s. per attendance.
Reading, Royal Berkshire Hospital.—Res. Anæsthetist. £150.
Royal College of Surgeons of England.—Member of the Court of Examiners.
Royal Free Hospital, &c., W.C. Obstetrical and Gynæcological Unit.—Sen. Asst. At rate of £350. Also Third Asst. £270.
Royal National Orthopædic Hospital, 234, Great Portland-street, W. Two H.S.'s. for Country Branch. Each at rate of £150.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E. H.S. At rate of £100.
Salvation Army Mothers' Hospital, Lower Clapton-road, E.—Sen. and Jun. Res. M.O.'s. At rate of £150 and £80 respectively.
Sheffield Royal Hospital.—Clin. Asst. for Ophth. Dept. At rate of £400.
St. Albans and Mid Herts Hospital and Dispensary.—Res. H.S. £150.
St. Leonard's Hospital, Hoxton-street, Shoreditch, N.—H.P. At rate of £80.

St. Mary Islington Hospital, Highgate-hill, N.—Asst. M.O. £250.
Taunton and Somerset Hospital.—Hon. Physician.
University College Hospital, Gower-street, W.C.—Hon. Anæsthetist. Also Obstet. Registrar. £125.
West Ham County Borough.—Two Temporary District M.O.'s. Each £270.
West London Hospital, Hammersmith-road, W.—Cas. O. £250.
Westminster Hospital, Broad Sanctuary, S.W.—H.S. to Ear, Nose, Throat and Eye Dept. At rate of £104.
Willesden Municipal (Fever) Hospital, Brentfield-road, N.W.—Res. M.O. £250.
Windsor, King Edward VII. Hospital.—Two H.S.'s. Each at rate of £100.
York County Hospital.—Res. Anæsthetist and Asst. H.S. £150.
The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Carlisle, Cumberland; Haltwhistle, Northumberland; and Eye, Suffolk.

Medical Diary

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, Nov. 14th.—5 P.M., THERAPEUTICS and PHARMACOLOGY. Suprarenal and Pituitary Tumours and their Correlation with Experimental Findings. Discussion to be opened by Prof. H. H. Woollard and Dr. R. D. Lawrence, followed by Dr. Gordon Holmes, Dr. F. Parkes Weber, Dr. P. M. F. Bishop, and others. Members of the Section of Neurology are specially invited. 8.30 P.M., PSYCHIATRY. Dr. Edward Mapother: Tough or Tender, a Plea for Nominalism in Psychiatry. (Presidential address).
THURSDAY.—5 P.M., DERMATOLOGY (Cases at 4 P.M.). Dr. Evelyn M. Holmes: Some Aspects of Dermatological Work in Denmark. Illustrated by lantern slides. Cases. Dr. H. Semon and Dr. Burrell: (1–4) Tuberculosis of the Skin treated by Injections of Tuberculin. Dr. H. Barber: (5) Coincident lupus vulgaris and lupus erythematosus. Dr. I. Muende: (6) Multiple Symmetrical Nævi of Face and Hands. 8.30 P.M., NEUROLOGY. Dr. H. L. Gordon: Neuro-spirochætosis in the East African Native. Members of the Section of Tropical Diseases are specially invited to attend.
FRIDAY.—5.30 P.M., PHYSICAL MEDICINE. Demonstration. Dr. James B. Mennell: Manipulative methods applied to the Lower Extremities. Members of the Orthopædics Section are specially invited. 8.15 P.M., OBSTETRICS and GYNÆCOLOGY. The Investigation and Treatment of the Toxæmias of Pregnancy. Discussion to be opened by Dame Louise McIlroy, Dr. A. A. Osman, and Mr. J. Bright Banister. 8.30 P.M., RADIOLOGY. The Importance of Posture in Radiodiagnosis. Discussion openers, Dr. E. W. Twining: The Skull. Dr. J. V. Sparks: The Chest. Dr. G. B. Bush: The Abdomen.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.
THURSDAY, Nov. 16th.—8.15 P.M. (at the Hospital for Tropical Diseases, Endsleigh-gardens, Gordon-street, W.C.). Clinical Evening. The following, amongst others, will give Demonstrations: Dr. P. A. Buxton, Sir Rickard Christophers, Dr. Mather Cordiner, Dr. G. M. Findlay, Colonel Clayton Lane, Dr. G. Carmichael Low, Colonel F. P. Mackie, Dr. P. Manson-Bahr, and Dr. N. Hamilton Fairley. Cinematograph films will be exhibited as follows by: (1) Dr. Monckton Copeman, showing the killing of cells (Protozoa) by invisible ultra-violet light; (2) Dr. P. Manson-Bahr, showing the clinical picture of cerebral trypanosomiasis in a European.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Nov. 13th.—8 P.M.: Clinical Evening.
THURSDAY.—5 P.M., Sir Humphry Rolleston: Association of Medical Men with Literature (Lloyd Roberts Lecture).

PADDINGTON MEDICAL SOCIETY.
TUESDAY, Nov. 14th.—9 P.M. (at the Great Western Royal Hotel, Paddington), Dr. Killick Millard: Euthanasia.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, Nov. 14th.—5 P.M., Dr. William G. Savage: Human Tuberculosis of Bovine Origin (Mitchell Lecture).

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn-fields, W.C.
MONDAY, Nov. 13th.—5 P.M., Mr. R. Davies-Colley: Specimens illustrating Diseases of Muscles.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Nov. 13th, to SUNDAY, Nov. 19th.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Evening M.R.C.P. Course. Tues. and Thurs., at 8 P.M.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Course in Medicine, Surgery, and Gynæcology. All day.—ST. PETER'S HOSPITAL FOR STONE, Henrietta-street, W.C. Course in Urology for advanced post-graduates. All day.—CITY OF LONDON HOSPITAL, Victoria Park, E. Course in Diseases of the Chest. All day.—LONDON LOCK HOSPITAL, Dean-street, W. Course in Venereal Disease. Afternoons and Evenings.—SAMARITAN HOSPITAL FOR WOMEN, Marylebone-road, N.W. Week-end Course in Gynæcology. All day Sat. and Sun.—B.M.A. HOUSE, Tavistock-square, W.C. A Lecture by Dr. William Moodie, on Mond. at 8.30 P.M., on Child Psychiatry and its Bearing on Behaviour.—PANEL OF TEACHERS. Individual clinics are available daily by arrangement with the Fellowship of Medicine. Courses, &c., arranged by the Fellowship of Medicine are open only to Members and Associates.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
MONDAY, Nov. 13th.—10 A.M., Dr. Hutchison: Ward Visit. 10.45 A.M., Dr. Wyllie: Medical Out-patients. 11.30 A.M., Mr. Lloyd: Surgical Out-patients. 2 P.M., Dr. Thursfield: Ward Visit.
TUESDAY.—10 A.M., Dr. Schlesinger: Medical Out-patients. 10.45 A.M., Mr. Higgins: Surgical Out-patients. 11.30 A.M., Pathological or Biochemical Demonstration. 2.30 P.M., Dr. Frew: Ward Visit.
WEDNESDAY.—10 A.M., Dr. Poynton: Ward Visit. 10.45 A.M., Dr. Paterson: Medical Out-patients. 10.45 A.M., Dr. Gray: Skin Dept. (Out-patients.) 11.30 A.M., Mr. Barrington-Ward: Surgical Out-patients. 2 P.M., Mr. Apperly: Dental Dept. (Out-patients).
THURSDAY.—10 A.M., Dr. Hutchison: Ward Visit. 10.45 A.M., Dr. Cockayne: Medical Out-patients. 11.30 A.M., Mr. Tyrrell-Gray: Surgical Out-patients. 2 P.M., Dr. Thursfield: Ward Visit. Mr. Higgins and Dr. Sington: Tonsils and Adenoids and Anæsthesia. (Demonstration.)
FRIDAY.—10.30 A.M., Dr. Pearson: Medical Out-patients. 11.15 A.M., Mr. Addison: Surgical Out-patients. 2.30 P.M., Dr. Frew: Ward Visit.
SATURDAY.—10 A.M., Dr. Poynton. Mr. Penman: Ophthalmic Dept. (Out-patients). 11 A.M., Mr. Browne: Surgical Out-patients.

CHARING CROSS HOSPITAL MEDICAL SCHOOL, Chandos-street, W.C.
SUNDAY, Nov. 12th.—10.30 A.M., Mr. Eric A Crook: The Later Stages of Malignant Disease. 11.45 A.M., Mr. E. D. D. Davis: Acute Infective Catarrh.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY, Nov. 16th.—4.30 P.M., Dr. J. A. Glover: Preventable Diseases of School-children. 9 P.M., Dr. C. Newman: Liver Function Failure.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Nov. 17th.—4 P.M., Mr. A. Lowndes Yates: Demonstration of Audiography.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL Post-graduate Lectures.
WEDNESDAY, Nov. 15th.—4 P.M., Dr. H. G. Gage: Recent Advances in Radiology.

ST. PAUL'S HOSPITAL, Endell-street, W.C.
WEDNESDAY, Nov. 15th.—4.30 P.M., Dr. A. Fraser Whyte: Genito-urinary Anæsthetics.

THE LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Nov. 14th.—5 P.M., Dr. H. W. Barber: Bacteriology and Mycology.
WEDNESDAY.—5 P.M., Dr. I. Muende: Pathology Demonstration.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Nov. 13th.—3.30 P.M., Dr. Kinnier Wilson: Disorders of Cerebral function: aphasia, apraxia, &c.
TUESDAY.—3.30 P.M., Dr. Denny Brown: Brain stem reflexes.
WEDNESDAY.—3.30 P.M., Dr. Collier: Clinical Demonstration.
THURSDAY.—3.30 P.M., Dr. Walshe: The Motor System.
FRIDAY.—3.30 P.M., Dr. Bernard Hart: The Psychoneuroses.
Out-patient Clinic each day at 2 P.M.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.
WEDNESDAY, Nov. 15th.—4 P.M., Major M. Sinclair: Fractures and Dislocations in General Practice—Practical Hints.

ROYAL INSTITUTE OF PUBLIC HEALTH, 23, Queen-square, W.C.
WEDNESDAY, Nov. 15th.—4 P.M., Dame Georgina Butler: Citizenship and the Care of Cripples.

CHADWICK PUBLIC LECTURES.
TUESDAY, Nov. 14th.—5.30 P.M. (at Manson House, Portland-place, W.), Dr. R. O. Moon: Housing and Town Planning in Relation to Public Health (Malcolm Morris Memorial Lecture). 8 P.M. (at the University, Reading), Mr. E. G. Haygarth Brown: Standards of Food in Relation to Public Health.

ANCOATS HOSPITAL, Manchester.
THURSDAY, Nov. 16th.—4.15 P.M., Dr. R. Ellis: Carcinoma of Lung.

MANCHESTER HOSPITAL FOR CONSUMPTON AND DISEASES OF THE THROAT AND CHEST, Hardman-street, Deansgate, Manchester.
WEDNESDAY, Nov. 15th.—4.30 P.M., Mr. V. F. Lambert: Mastoiditis.

GLASGOW Post-graduate Lectures.
TUESDAY, Nov. 14th.—3.30 P.M. (in the Faculty Hall, Vincent-street), Prof. A. Hunter: Rôle of the Vitamins. 4.15 P.M. (at the Royal Hospital for Sick Children), Prof. G. Fleming: Medical Cases.

LEEDS GENERAL INFIRMARY.
TUESDAY, Nov. 14th.—4 P.M., Dr. Moll: Demonstration of Chest Cases.

MANCHESTER ROYAL INFIRMARY.
TUESDAY, Nov. 14th.—4.15 P.M., Mr. A. H. Southam: Surgical Lesions of the Anal Canal.
FRIDAY.—4.15 P.M., Mr. C. Roberts: Demonstration of Surgical Cases.

NOTES, COMMENTS, AND ABSTRACTS

SANITATION IN MEDIÆVAL MONASTERIES

IN a Chadwick lecture given in London on Nov. 2nd Dr. Percy Flemming pointed out that the builders and engineers of the mediæval monastery had to provide sanitary arrangements for a household which might number 50–60 or, at times, 70 monks with a large number of lay brothers in addition. Their work reached a high standard of efficiency—a standard not maintained in the centuries that immediately followed their dissolution.

At first the monasteries were dependent on wells for their water-supply, but later a supply by gravitation became the rule. The twelfth century plan of the monastery of Christ Church, Canterbury, shows that the water was collected into a conduit house some distance from the city, whence it was conveyed to the monastery through lead pipes which passed the water through five settling tanks before reaching the city wall. Similar tanks are shown on the fifteenth century plan of the water-supply of the London Masterhouse. Within the monastic precincts the water was conveyed in the first place to the infirmary, then to the lavatories for hand washing, and thence to the various domestic offices. There were two types of lavatory: an earlier one consisting of an octagonal building containing a basin of similar shape, and a later one, much more common, in the form of a lead-lined stone trough which either projected into the cloister park or was fixed in a recess or either side of the frater door. Baths were provided for guests and for medical purposes, but the rule forbade their regular use by the monks. The lay-out of the monastic buildings was arranged to secure efficient drainage. The great drain was flushed either by turning the tail of the mill race into it or by letting the waste water run through it. The sanitary block (*domus necessaria* or *necessarium*) was placed over the great drain or a running stream. Privies were arranged in rows placed over the drain or stream, each being lighted by a small window or separated from its neighbours by a wooden partition. A doorway led from the dormitory to the sanitary block. At Canterbury there were 55 privies.

The Carthusian monastery required a different plan, for each monk lived alone in a cell situated in the corner of a little garden. Water was supplied to each cell by means of a lead pipe, the tap being placed in a recess in the lobby of the cell. Each cell had a separate privy reached through a door in the back wall of the garden, the path from the cell to the privy being protected by a wooden penticle. At Mount Grace Priory the privies were placed over a running stream just outside the garden wall.

IN DEFENCE OF ROTUNDITY

Dr. Christopher Howard writes: "Will you grant me the hospitality of your columns to protest on behalf of the obese, amongst whom I am proud to acknowledge myself no small member, against the pseudo-scientific pontifical pronouncements which have lately been reported by you and by others who lack your wisdom (see THE LANCET, Oct. 14th, p. 871; Oct. 28th, p. 994). It is true that in a leading article you have refused to subscribe to the pronouncement that reduction of weight is conditioned simply by the fortitude of the patient, and perhaps you would not willingly align yourself with those superior beings who, in your current issue, refer to us as 'those unfortunates.' In one breath we are denied virility, and in the next classed with the sad sisterhood! It is presumably beyond the comprehension of our critics that phylogenesis is a stronger force than ontogenesis, and that the protoplasmic experience of centuries is worth more than the laboured deductions of individual minds (even the minds of the thin). If you rob a fat man of his fat you force him to run counter to his ancestral chromosomes. Attenuated beings who gorge to the full and yet continue to look tænial have the impertinence to accuse us of greed because we eat when we are hungry. If, from foolish fear of the mirth which our jolly and rotund appearance often provokes in the animated skeletons who lecture us, we are constrained to deny ourselves, we either deservedly fall victims to some intercurrent disease or develop duodenal ulcers—or remain fat. In the latter contingency we are then insulted and told that we suffer from a lack of glandular balance. As a class we are not easily moved to wrath—not because we are Fröhlichs but because we are philosophers—and we have allowed a host of professors and dietitians (foul and misbegotten word) to give vent to opinions conceived in the sterility of the laboratory, dead products of insufficient mental digestion or gestation. Will you, Sir, publish abroad the fact that we glory in our fat, our laughter, our good temper, our sociability, our appreciation of food and drink, and company? We would rather die in full possession of our faculties in our middle age than totter about in scrawny-legged misery for a few extra years, lean and lonely lepers, suspicious and suspected. We will not be pitied—for we glory in our curves—nor condemned, either as financial criminals (the silliest statement I ever saw in a scientific journal) or lazy loungers. We are the salt of the earth, so let us damn the diet writers and stick to our savoury."

TREATMENT FOR CASES OF META FUEL POISONING

IN view of the two deaths recorded in this country of adults who have swallowed Meta fuel, the following course of treatment recommended by Dr. Laszlo Wamoscher, associate professor at the Hygiene Institute, University of Berlin, has been submitted to us for publication by the agents for its sale in Great Britain, Messrs. Elmesan (London), Ltd.

1. Immediate washouts of the stomach with large quantities of sod. bicarb. solution. These should be repeated frequently and performed slowly for the first time on account of the development of CO_2. (It is essential to neutralise the acidity in the stomach since meta fuel does not depolymerise in alkaline medium and only the products of depolymerisation are toxic.)
2. High colon washouts with alkaline solutions.
3. Purgatives after washing out: Glauber salts or castor oil. No phenolphthalein or acids.
4. Large quantities of charcoal by the mouth, preferably wood charcoal.
5. For the heart: caffeine and if necessary strophanthin, intravenously.
6. Narcotics should be avoided if possible. Intensive cramp should be treated by the sodium salt of Veronal.
7. Intravenous injections of calcium (Sandoz) and repeated intravenous injections of 30–40 per cent. glucose.

We are informed that meta fuel is a pure uniform organic chemical substance, namely, metaldehyde, a polymer of acetaldehyde.

THE "HYGENICAP"

UNDER this title Messrs. P. Cassin, Ltd., of 19, Eastcheap, London, E.C. (the patentees), have called our attention to a collapsible metal tube such as is used for ointments and tooth pastes, with a new form of cap. This cap is a cork-lined disk fitted eccentrically to the opening of the tube in such a manner that, on being revolved, its cutting edge removes the seal from the opening of the tube, the opening being closed at the same time. The principle of the wedge is used to keep the cork-lined cover pressed tightly. This ingenious way of closing collapsible tubes seems to be effective and convenient, and should prevent the annoyance and danger of contamination of the contents of the tube, resulting from a lost screw cap, as well as doing away with the trouble of piercing a hard seal.

A PLAY ABOUT ED·NB·RGH STUDENTS

IT is perhaps a pity that the fashion of having alternative titles has lapsed. For example, the intending playgoer would have a better idea of "The Wind and the Rain," now produced at the St. Martin's Theatre in London, if the author had added: "or Beer and Bones." Some at least would wish to be excused from taking the troubles of the hero too seriously, but most of us would enjoy spending a few hours among his engaging companions. The action takes place in a thinly disguised Scottish university city—its nearest golfing centre is North Berwick—and the scene is the common room of a students' lodging-house. Mrs. McFee, the landlady, confesses to a penchant for medical students, which perhaps explains why we meet only members of that faculty. When the play begins the hero, Charles Tritton, is arriving, an enthusiastic "fresher"; a large parcel of bones and "Gray's Anatomy" seem to be his principal luggage. At the end of the play he is already a doctor of some three weeks' standing and five years have elapsed. If the chronology of the play is somewhat atypical—the session opens in mid-September, and within a fortnight of his introduction to medicine the fresher is already hard at work in the dissecting-room—we may accept its aberrations as the author's contribution to the vexed question of the medical curriculum, and remain grateful for the light-hearted company to which he introduces us. In Charles Tritton's three fellow-lodgers are portrayed three types of students: Paul Duhamel, the older man, who is spasmodically working for his fellowship; Gilbert Raymond, who is equally at home with a gramophone and a ukelele, but usually feels after an examination that he should write to the examiners and apologise for having troubled them; John Williams, who has many athletic interests but also contrives to absorb a certain amount of medical knowledge. Of the undergraduates, Tritton, as befits a hero, alone completes his course in five years. The plot, however, is less convincing than the background and atmosphere. The author has given so much charm and kindliness to Anne Hargraves, whom Tritton meets in Edinburgh, and so little to Jill Mannering, whom his mother has chosen as a possible wife for him, that his conflict of loyalties does not move us, especially as we never see the mother. Miss Celia Johnson plays Anne so graciously that our bewilderment at his difficulty in choice is only increased.

The title of the play and the admittedly humid climate of Edinburgh are both over-emphasised by the soused trench-coat which every male member of the cast always wears on entering.

UNDULANT FEVER IN PERSIA

Two members of the staff of the Russian Soviet's Hospital at Teheran report[1] 14 cases of "Malta fever" admitted to that hospital in the last half of 1932, 11 of them under the authors' care. The fever was characterised by the usual temperature curve with relapses, profuse sweating and constipation, and arthralgia towards the end. Of their 11 patients, 1 died, 7 recovered (averaging 7 relapses each), and 3 remained under treatment. Some fell ill in Teheran, other cases were infected elsewhere and were sent in for further examination after prolonged and profitless treatment, mainly for malaria. Of the 14 cases, 12 were diagnosed by blood culture, which was usually positive if the temperature was above 102° F., but was only twice positive at as low a temperature as 100·5°. Few cases were seen earlier than the second month, but one of the authors, infected in the laboratory, had a positive blood culture (temperature 101°) 15 days before his fever began. The blood of every patient agglutinated *Micrococcus melitensis* in dilutions 1/200 or 1/1600 except for two, a mother and son; the complement-fixation reaction also was negative in these two cases. The authors made their cultures themselves and inoculated rabbits at Teheran, but later they got cultures of *M. melitensis* and *Brucella abortus* Bang from Baku, and the results were identical. They ascribe the individual cases to sheep and goat's cheese and, in Teheran, to goat's milk. None of the patients had anything to do with cattle and they came from north and central Persia. The paper is followed by a note from Dr. M. Mayer, of the Hamburg Hospital for Tropical Diseases, telling that a specimen of Malta fever blood had been recently sent him from Teheran for diagnosis and that he had seen this year a patient from Persepolis (south-west Persia) also suffering from Malta or undulant fever. The disease had been reported from Central Asia and its discovery in Persia was to have been expected.

[1] Alymoff, A. J., and Balayan, A. B.: Arch. f. Schiffs.- u. Trop.-Hyg., October, 1933, p. 451.

MEAT INSPECTION IN SCOTLAND

THOSE who have to understand and administer meat regulations in Scotland will appreciate the issue by Dr. Gerald Leighton of a little book on the subject.[1] It gives an adequate explanation of the regulations, lays down a systematic method and procedure for routine inspection, and sets out the regulations and standards whereby meat shall be judged in Scotland. The definitions, explanations o the reasons for the various regulations, and the relative importance of the different sections are well described. Though the legal position in England is not the same or so satisfactory, a good deal of the matter will be of interest to English meat inspectors. A valuable section is devoted to adequate record keeping. The book is issued with the approval and consent of the Department of Health for Scotland.

NEW PREPARATIONS

PYMOSEL AND PYMOSEL TÆNIA.—These are preparations for the destruction of intestinal worms, the formula for which is the result of researches made by a group of French authorities. The active principles of pyrethrum were made the subject of investigation by Dr. J. Chevalier and Mr. F. Mercier some ten years ago, and the results were published in a Compte Rendu of the Académie des Sciences in 1923. Preparation of the pyrethrines followed upon this work, standardisation and dosage being arrived at by Prof. E. Perrot with collaborators, whose reports were communicated to the Académie de Médecine in 1931 and the Société de Thérapeutique at the same time, and later in this year. Clinical experience followed in various hospitals in Paris, reports of which have appeared in French medical literature. Two preparations are now placed on the market—pymosel for the destruction of intestinal worms and parasites, and pymosel tænia to be used for the expulsion of tape-worms. The former is supplied in granules, and the latter in tablets, a higher dosage being required. The drugs come from the firm of S. A. Vermenes, Paris, the English distributors being Messrs. Harwood (Chemists), Ltd., Watford, Herts.

SARIDONE (Hoffmann-La Roche Chemical Works Ltd., 51, Bowes-road, London, N.13).—This preparation is issued in the form of grs. 5 oral tablets, each of which contains phenyldimethylisopropyl pyrazolon grs. 1¼, phenacetin grs. 2½, caffeine gr. ½, and starch gr. ¼. This combination of phenacetin and caffeine with a new antipyrin derivative has been found to act quickly as an analgesic with no harmful accompaniments, while its prudent dosage is suggested on the metal tube containers.

[1] Pocket Handbook of Meat Inspection. A Guide to the Public Health (Meat) Regulations (Scotland), 1932. Second edition. By Gerald Leighton, O.B.E., M.D., F.R.S.E., Medical Officer (Foods) Department of Health for Scotland. Edinburgh and London: William Hodge and Co. 1933. Pp. 137. 6s.

PRINCE OF WALES' GENERAL HOSPITAL.—The annual dinner of the reunion association of this hospital will be held at the Trocadero Restaurant, London, W., on Thursday, Nov. 23rd, at 7.45 for 8 P.M., with Mr. William Ibbotson in the chair. The hon. secretary is Dr. Bertram H. Jones, 47, Queen Anne-street, W.1.

ADDRESSES AND ORIGINAL ARTICLES

NUTRITION AND CHILD-BEARING *

BY EDWARD MELLANBY, M.D. CAMB., F.R.C.P. LOND., F.R.S.

PROFESSOR OF PHARMACOLOGY, UNIVERSITY OF SHEFFIELD; PHYSICIAN, ROYAL INFIRMARY, SHEFFIELD

IN recent years the subject of child-bearing has become of greater public interest. There are several reasons for this increased interest, but the one which concerns us to-day is the mortality-rate and the high incidence of disease in mothers and infants incurred by this natural process. Four or five women die in each thousand births and, in spite of the great advance in medical knowledge in recent times, this figure becomes no smaller. For each woman who dies in or as the result of childbirth, a large number are seriously ill, suffering from all the well-known ailments of pregnancy and childbirth which need not be enumerated here. In addition to specific forms of illness, the general health of the average pregnant woman is so poor that it has become a general presumption that she is an invalid at such times. Now if all women in pregnancy were ill, we would have to accept the situation without further cavil. Some women, however, even in this country, carry out their ordinary work during pregnancy and never have a moment's illness throughout the period. Indeed in a few cases women are known to say that they are never so well as when pregnant. This surely ought to be the normal course, and even morning sickness, which is so common in pregnancy, should be regarded as an abnormality. It is our duty as medical men and scientists to find the cause of this undesirable state of affairs.

Nor does this problem affect only the mother. The death-rate of infants in the first week of life is about 23·5 per thousand live births, while this figure is increased to about 33 per thousand if the first month of life be substituted for the first week. If stillbirth and death in the first two weeks are combined, the mortality-rate may be as much as 80 per thousand live births. It is disconcerting to find that this figure also has not been reduced in recent years to anything like the extent of the mortality-rates of older infants. There is, in fact, reason to believe that the maternal mortality and neonatal death-rates are associated, especially as they both show this stubborn resistance to yield to greater knowledge.

These high mortality-rates and the large amount of sickness and disability associated with child-bearing could, I believe, be substantially reduced by proper nutrition, and it is my task to-day to afford some evidence for this belief. I admit at once that direct and accurate knowledge of this subject in human beings is meagre because, in its modern aspect, nutrition in relation to child-bearing has been little investigated. If, however, working from known and established facts, I can show you how serious are the results of specific dietetic defects in pregnancy, both for mother and child, you will probably agree that, when knowledge is more complete, this aspect of the problem will prove to be much more important even than appears at the present time. So that, however much stress I lay on the nutritional side, and however dire the consequences of the defective feeding which I describe, you may be sure that future research will only expand and emphasise the relation between nutrition and the physiological processes of child-bearing.

So obvious is the truth of these statements that it has long been a great puzzle to me why so little thought and work has been given to this aspect of life and health. The attention of the medical man has been so fixed on the actual mechanical process of childbirth and on the treatment of the illnesses associated with pregnancy as they arise, that he seems to have forgotten that underlying all these is the general problem of the relation of the nutrition of the mother to the normal functioning of her organs. Even in antenatal clinics it is the size and shape of the pelvis, the lie of the child in utero, the blood pressure, and the condition of the urine about which most interest is centred. Twenty years ago this attitude could be easily understood, but recently we have learnt much about the serious consequences of a deficiency in many essential food substances, and with pregnancy superadded, these consequences must be greatly magnified. In parturition itself all attention has been focused on sepsis. Far be it from me to decry this care, but it might be well to remember that the soil is often as important as the seed and that if there is any evidence which suggests that by nutritional means the resistance of the mother to infection can be raised, such a course ought to be adopted. Good feeding, in the modern sense of the word, can only be beneficial, probably even as regards resistance to infection.

The General Problem

Let us first see why nutrition must be of special importance in pregnancy. We know that (1) pregnancy involves the development and growth of the fœtus, placenta, membranes, and fluids which at birth may form about 16 per cent. of the maternal weight: the chemical substances used for building tissues must come from the mother, either from her own stores or indirectly from the food she eats; (2) that many chemical substances essential to proper structure, function, and even to life are in some cases only present in small quantities in the maternal organs and that they cannot be synthesised by either the mother or fœtus, so that unless a sufficiency of these substances

TABLE I.—*Composition at Birth (in grammes)*

—	Weight.	Ash.	N.	S.	P.	Ca.	Mg.
Child	4180	113	83	0·9	18	30	1·0
Placenta	735	4	17	0·03	0·1	0·2	0·02
Umbilical cord and membrane ..	81	0·2	2·0	0·2	0·03	0·04	0·01
Amniotic fluid ..	2000	21	0·7	0·04	0·6	—	—
Placental blood ..	100	0·9	3·6	0·01	0·01	0·01	0·01
Total	7100	138·0	106·0	1·2	19·0	31·0	1·0

Total protein in baby at birth = about 550 grammes.

(or their effective precursors) are taken in the food, both mother and offspring must go short and suffer in consequence. In Table I. the composition, in terms of some of the elements, of the average baby at birth as found by Hoffström [1] is seen. These figures give a quantitative idea of some of the nutritional factors which the maternal organism must supply, either directly or indirectly, to the developing fœtus.

The actual mechanism whereby the fœtus claims and obtains nourishment for development, like all

* The Lloyd-Roberts lecture delivered at St. Mary's Hospital, Manchester, Oct. 24th, 1933.

other fundamental problems of life, is unknown. It is of interest, however, to realise that the source of nourishment supplied to the fœtus is in itself a most interesting and complicated problem. It might be thought that so long as there were sufficient food elements in the blood stream it would not matter whether the fœtus grew at the expense of the tissues and stores of the mother or at the expense of the food she ate. This does not seem to be the case, at least in lower animals and most probably in man. At the end of the first half of pregnancy the fœtus and its attachments are negligible in weight as compared with that of the mother. During the second half the growth of the fœtus is rapid and is by no means negligible in terms of comparative weight at full term.

TABLE II.—*Growth of Human Fœtus showing (in grammes) the rate of added elements in pregnancy*
("Science of Nutrition."—Lusk)

C.O. = Content of ovum; A.W. = Added per week.

Week of pregnancy.	Nitrogen.		Phosphorus.		Calcium.		Magnesium.	
	C.O.	A.W.	C.O.	A.W.	C.O.	A.W.	C.O.	A.W.
16th ..	4·3	1·1	0·7	0·2	0·4	0·4	0·03	0·02
20th ..	8·8	..	1·5	..	2·0	..	0·09	..
21st ..	..	1·8	..	0·2	..	0·4	..	0·02
28th ..	23·3	..	3·6	..	5·4	..	0·23	..
29th ..	..	6·9	..	1·3	..	2·1	..	0·06
40th ..	105·8	6·9	18·9	1·3	30·5	2·1	1·004	0·06

The rapid growth of the fœtus and the corresponding greater demands on nutritional factors in the second half of pregnancy is shown in Table II.[2] It might appear, therefore, at first sight, that the mother would find it easy to nourish the fœtus in the first half of pregnancy and difficult later. This is not the case. Actually, as regards nitrogen, the maternal organism is often in a state of negative balance in the early months; that is to say, she really loses a good deal of her own protein whereas, on the same diet, she usually retains nitrogen in the second half of pregnancy. The probable interpretation of this is that the early fœtal growth not only takes place at the expense of the maternal tissues but causes an extravagant breaking down of these to enable it to get its requirements, in the form possibly of some specific amino-acids or other organic complexes. At a later stage the fœtus grows more at the expense of the maternal food. Whether this early sacrifice of the tissues of the mother can be reduced by better feeding in the sense of more complete dietary is not known. If, however, this mechanism involving the lavish breakdown of maternal tissues, which seems necessary for the initiation and early development of the young fœtus, is related in any way to morning sickness—such a prominent feature of this period—it may be possible to reduce or eliminate this symptom by correct nutritional conditions.

It seems unprofitable to spend much time on the large question of nutrition, in so far as it concerns the energy-bearing factors of food—the proteins, fats, and carbohydrates—in relation to pregnancy. Modern research and in particular a knowledge of the dietetic habits of different races show that the ordinary diet can vary widely in these elements and yet remain compatible with good maternal health and satisfactory development of the offspring. Indeed, surprise is often expressed at the good development and health of babies born of mothers whose diet has been well below the normal in calorie and protein intake. This must involve a greater sacrifice of maternal tissues to the developing embryo.

A Balanced Dietary

It is generally held that excessive feeding in pregnancy does more harm both to the mother and offspring than underfeeding. Particular suspicion is attached to the possible effects of high protein intake and especially of meat in the development of eclampsia. Whatever truth there is in the idea, it cannot represent the whole truth, for otherwise all Eskimo women, whose relative protein intake is very high, would develop eclampsia in pregnancy. It is more probable that a high protein diet calls for a larger intake of some other dietary factor, just as we know that a high cereal diet calls for increased consumption of protective foods such as milk and green vegetables to prevent damage. No nutritional phenomenon is more firmly established by recent research than the fact that some foods,[3] and especially cereals, are harmful in certain ways and that they can be rendered innocuous and their good nutritional qualities retained by a balanced consumption of protective foods. Unbalanced dietary, perhaps with a high meat consumption and certainly with a high bread and other cereal consumption, is one of the fundamental nutritional causes of trouble in pregnancy.

It is certain that the significance of correct nutrition in child-bearing does not begin in pregnancy itself or even in the adult female before pregnancy. It looms large as soon as a female child is born and indeed in its intra-uterine life. The presence of a contracted and misshapen pelvis due to rickets is the result of malnutrition in early life. It is unnecessary to emphasise the sequelæ of pregnancy in women with pelvic defects. Where it is especially common, as in Glasgow, the troubles of child-bearing and the maternal and neonatal mortality increase greatly. We know so well to-day how to prevent rickets that it ought to be regarded as a crime if it is allowed to develop in any child. A mixed diet including a pint and a half of milk for a child under two, and at least a pint subsequently, together with a dessert or tablespoonful of cod-liver oil given daily, winter and summer, ought to prevent rickets and thus exclude this particular difficulty of pregnancy. It may be said that, even if rickets develops in a girl and produces great deformity of the legs, continuous antirachitic dietary may cure the disease and correct the deformity. This is certainly true, but, so far as I know, it has never been proved that the pelvic size and shape as well as the legs recover. The point requires investigation. It is probable that pelvic deformities are not corrected so easily as the leg deformities, for I believe it is not unusual for gynæcologists to find an obviously rachitic pelvis without the legs showing much rachitic defect. In any case, the complete prevention of rickets is desirable and possible, and its elimination would greatly reduce the amount of surgical interference in childbirth and the undesirable sequelæ which follow. There is no reason why every woman should not undertake the function of child-bearing without any rachitic stigmata affecting the pelvis. But rickets in the female child and the resulting contracted pelvis of the future mother must be considered a stage further back; rickets may even develop, in rare instances, in utero as shown by Maxwell,[4] but what is more significant is that defective feeding of the maternal organism tends to increase the liability of the offspring after birth to this disease. This fact I showed in dogs by feeding comparable bitches during pregnancy on a rickets-producing and good diet respectively, and subsequently following up the bone changes in the offspring after birth on giving a rickets-producing diet.[5]

These two more remote effects relating to defective calcification show :—

(1) The necessity of the correct feeding of female infants to prevent the development of contracted and misshapen pelves of the adult.

(2) The necessity of feeding women during pregnancy in such a way that their offspring after birth do not have either osteoporosis or an increased tendency to rickets.

Calcium-Phosphorus Metabolism

The problem of rickets clearly involves the whole question of calcification and calcium-phosphorus metabolism and I shall, therefore, consider the matter in more detail. The retention of calcium and phosphorus in the body does not only depend on giving sufficient of these substances in the food. Some of the known facts bearing on this point include :

(1) The calcium and phosphorus intake must be sufficient in quantity and, within certain limits, which vary under different conditions, ought to be balanced.

(2) The retention of these substances in the body is greatly influenced by the presence or absence of vitamin D. Thus, with an adequate intake of this vitamin available, a comparatively small amount of calcium and phosphorus or a greater abnormality than usual in the ratio of these elements can often be overcome with the production of well-calcified bones and teeth. Obviously, there are limits to which the calcium and phosphorus intake can be reduced. The amount of these elements in the food may be too low to allow perfect formation of bones and teeth even if they are completely retained. Similarly, a great excess of vitamin D may drive out calcium and phosphorus from the bones and deposit them in the arteries, especially those of the kidneys.

(3) Calcium and phosphorus of different foods are retained by the body to different extents. For instance, in milk they are in a more suitable form for retention than in cereals. In fact, the calcium and phosphorus of cereals are often not only not retained but these foodstuffs seem even to prevent the retention of these elements in other foods. Cereals, especially cereals rich in calcium and phosphorus, such as oatmeal and cereal embryo, are anticalcifying and rickets-producing, whereas milk has a calcifying and antirachitic action. The greater the bulk of cereals eaten the greater must be the amount of calcium and calcium-retaining factors, e.g., milk, including vitamin D, ingested to balance their detrimental effect.

Let us now see the import of these facts. The average new-born baby contains about 30 g. of calcium and about 19 g. of phosphorus. Between the 28th week of pregnancy and full term—i.e., the 40th week—the fœtal retention of calcium is 25 g. and of phosphorus 15–16 g. These are very large quantities when it is remembered that the average normal adult is in calcium and phosphorus equilibrium when the intake is approximately 0·7 g. Ca and 1 g. P daily. The quantity necessary varies greatly according to other conditions as mentioned above, but less than a gramme of calcium and rather over a gramme of phosphorus represent a fair daily intake of these elements. There is abundant evidence, however, that an intake of 0·7 g. of calcium is never reached by many people. For instance, a diet of bread, margarine, lard, jam, rice, meat, fish, tea, and sugar is very low in calcium content, and yet these are the staple articles of diet and form the bulk of the food of the poor. Imagine a pregnant woman on such a diet, and this must often be the case, and yet over the last 12 weeks of pregnancy she has to supply 25 g. of calcium to the fœtus and after its birth continue this process for months on end—for at least a pint of human milk is given daily to a suckling infant and this contains about 1·3 g. of calcium. A special investigation on this point was made by K. U. and G. Toverud [6] on 16 women. Towards the end of pregnancy they found all were in a negative calcium balance and 11 in negative phosphorus balance. The negative balances could be made positive by increasing the calcium intake 1·6 g. and the phosphorus 1·8 g. daily or in some cases by increasing the vitamin D by giving cod-liver oil or egg-yolk.

It will be evident from these figures that the pregnant and lactating woman often has to supply calcium to the fœtus and milk from her own stores, i.e., from her bones. To what extent she suffers thereby we have no accurate knowledge under ordinary conditions. It is, of course, widely accepted that pregnancy means increase in carious teeth (" a tooth for a child ") and this may well be related to deprivation of calcium, since it has been shown in children that increased retention of calcium by giving a high milk and high vitamin D intake inhibits dental caries (M. Mellanby [7]). The other clear evidence of the effect on pregnancy, so far as calcium metabolism is concerned, of a low calcium diet is rare in this country but common in some eastern countries, especially India and China. I refer to the disease osteomalacia. In these countries the diet is often largely composed of cereals, and with each succeeding pregnancy the denudation of the bone reserves is increased until the woman is often dreadfully deformed. Osteomalacia is now definitely established as equivalent to rickets in the adult, and can be cured by giving milk or some other source of calcium together with cod-liver oil or vitamin D. Although florid osteomalacia is not often seen in England, it would be a great mistake to assume that the average pregnant woman in this country escapes all the consequences of this dietetic defect. It is probable that many women suffer some osteoporotic change owing to pregnancy, and Maxwell says that if more careful examination were made, incipient osteomalacia would more often be found in such women.

Recently Theobald [8] has claimed that many of the symptoms of toxæmias of pregnancy disappear in pregnant women when calcium gluconate and vitamin D are injected. He described great improvement by this therapy in pregnant women suffering from excessive salivation, cramps, vomiting of pregnancy, œdema, dermatitis herpetiformis, chorea, and raised blood pressure. Whether this treatment is as effective as stated by Theobald must remain for further confirmation, as must also the problem as to whether its implication that these conditions can be prevented by an adequate supply of calcium and vitamin D throughout pregnancy. It seems to me clear, however, that, correct in detail or not, this worker is probably on the right track in suggesting a dietetic origin of these distressing and common illnesses of pregnancy. The reason, however, why I doubt whether abnormal calcium metabolism is the primary basis of toxæmias of pregnancy is that in incipient osteomalacia these are not prominent features. So far as I know, early osteomalacia is characterised by twitchings of the muscles, restlessness, and sleeplessness, difficulty in walking, with a characteristic gait and nausea, pain over back and thighs. Except for nausea and possibly sleeplessness, there is but little in common between early osteomalacia, which is certainly a calcium-deficiency disease, and the toxæmias of pregnancy. Great activity of the fœtus in utero is also an interesting incident in osteomalacia. This subsides when the diet is adjusted as regards calcium and vitamin D.

I have referred to the baneful effects of imperfect calcium metabolism due to malnutrition of pregnancy in draining the calcium supplies and so tending to induce osteoporosis in the mother and rickets in the child, but I cannot leave this subject without referring

to the teeth. It is unnecessary to dwell on the deplorable state of the teeth in this country. Is it not time, now we know a great deal about preventing this disease, that we took some steps to act up to this knowledge? The first necessity is to produce perfectly formed teeth and jaws and, since calcification of the milk teeth is well advanced in utero, the feeding of the mother during pregnancy and lactation on a diet of high calcifying qualities is essential (M. Mellanby [8a]). The sooner this mechanism for perfect tooth calcification is set going the better it will withstand the handicaps of postnatal feeding. The maternal diet should contain much milk, egg-yolk, and vegetables, and the intake of cereals should be reduced. Such a diet will help the mother to preserve her own teeth from decay and will help to ensure perfectly formed milk teeth in the baby. At birth, calcification of the permanent first molar begins and other permanent teeth are then formed in the jaws in a procession which does not cease till growth stops about the eighteenth year. Complete breast-feeding with a well-fed mother up to the end of nine months of extra-uterine life followed by a diet containing 1½ pints to 2 pints of cow's milk for the first three or four years and longer, if possible, and not less than a pint daily after this, will do more to eliminate the need of dentistry than all the dental hygiene—tooth-brushes, tooth-pastes, and mouth-washes—in the world. The addition of cod-liver oil—2 to 4 drachms daily—ensures a good supply of vitamin D, and while it is of great benefit when given to the mother during pregnancy, it is essential to the baby after birth. Cod-liver oil is rich also in vitamin A and will prevent those hyperplastic changes of the gum epithelium which ultimately result in pyorrhœa alveolaris (M. Mellanby [9]). Its content of iodine, to be referred to later, will prevent hyperplastic changes in the thyroid and so tend to eliminate simple goitre. Indeed, cod-liver oil is probably the greatest single nutritional factor, next to milk, in preventive medicine that the human race has ever possessed. Recently a well-known veterinary surgeon said that in the past 20 years the most important cause of the improvement of dog breeding has been the introduction of cod-liver oil into the diet. Why should veterinary surgeons and dog breeders have a greater appreciation of this wonderful remedy than those of us who are primarily interested in human beings?

Iron and Other Hæmatinic Principles in Food

Chlorosis, so widespread among women of this country at one time, has practically disappeared during the past 20 years; it might, therefore, be thought that the problem of anæmia and iron metabolism had solved itself. That this is incorrect is shown by the recent investigations of Mackay and Goodfellow,[10] and those of Parsons and his collaborators,[11] on infants. It is probable also that anæmia in pregnancy has a high incidence; it certainly has in India where it is a big problem, as we know from the investigation of Wills.[12] It is probable that anæmia in pregnancy is more common in this country than is generally recognised. Mackay and Goodfellow found that 45 per cent. of breast-fed and 51 per cent. of artificially fed babies under 12 months of age in certain London clinics were anæmic. There is reason for indicting maternal nutrition during pregnancy as the cause of nutritional anæmia in infants, although clear experimental proof of this is not established. The well-known facts are: (1) that a milk diet, whether of human or cow's milk, is so deficient in iron that it produces anæmia if no other source of iron is given; (2) that a fœtus has a natural tendency to store iron in its liver to tide it over the milk diet period and prevent too large a fall in its hæmoglobin content during lactation. It was shown by Zaleski [13] that the liver of puppies just after birth contained, in 100 g. of dried liver, 391 mg. of iron as compared with 78 and 43 mg. in the same weight of liver of adult dogs. In the human fœtus Hugouneng [14] found that two-thirds of the iron present in the liver at birth was deposited during the last three months of intra-uterine life. There is clearly, then, a large drain made by the fœtus on the iron stores and food-supply of the mother during pregnancy. It is natural therefore to assume that a failure to supply a mother at the time with sufficient iron must result in a failure on the part of the fœtus to store sufficient to supply the requisite quantity for the milk-feeding period. Clearly also a premature baby is especially liable to be short of iron stores.

This, however, is only a part of the story, for modern research on anæmia has demonstrated that hæmoglobin production is closely wrapped up with red blood corpuscle formation from normoblasts, and these in turn from megaloblasts. At each stage some specific nutritional factor is necessary, and a deficiency of an essential factor causes a breakdown of the mechanism and a development of some type of anæmia.

We know, for instance, that copper plays an important part in these operations (Hart et al [15]). Copper, like iron, is stored in the liver and is higher in concentration in young animals at birth than in the adult. The presence of copper seems to aid maturation of the normoblast to the erythrocyte.

Again, the work of Wills and Mehta [16] shows that a supply of iron is not sufficient to prevent or to cure the macrocytic anæmia associated with pregnancy which is commonly seen in India. For the alleviation of this form of anæmia the liver-active principle, or its equivalent in desiccated pig's stomach, or some constituent of autolysed yeast, curative of pernicious anæmia, is necessary. As is well known these substances control the conversion of megaloblasts to normoblasts.

It is certain therefore that anæmia, both in pregnant women and in infants after birth, is the result of some fault in a complicated mechanism, and that in order to prevent it we must make use of all our present knowledge by including in the maternal diet a sufficiency of each known factor necessary for hæmoglobin and red cell formation. Thus, in addition to supplying the mother daily with foods rich in iron, such as meat, egg-yolk, and green vegetables, calf's liver, which supplies both the hæmopoietic principle and some copper, ought to be given occasionally, say once weekly, during pregnancy and especially during the last few months of pregnancy. If a woman has achlorhydria mammalian liver ought to be given still more frequently in pregnancy.

Although simple anæmia of infancy is readily cured by iron therapy, as for instance by giving iron and ammonium citrate, it ought to be possible, by proper feeding of the mother, to avoid the necessity of this unnatural treatment. Mackay [10] has pointed out that this form of malnutrition in infants is of much greater importance than might be thought, for the morbidity figures of anæmic children, especially in regard to susceptibility to infection, are greater than in normal infants. To what extent pregnant women in this country suffer from anæmia I am unable to say, but it is probable that it is a serious disability at this period and may possibly be an additional factor in increasing the susceptibility of such women to puerperal sepsis.

ST. MARY'S HOSPITAL

Other Metals

Orent and McCollum [17] have made observations on the effect of deprivation of manganese in female rats. These workers showed that females on a manganese-free diet grow to maturity and produce the normal number of young. They are, however, indifferent to their offspring and give them neither care nor opportunity to suckle; as soon as a small amount of manganese is added to the basal diet they behave normally in this respect. It is an impressive thought that the absence of maternal affection may depend on a deficiency of a metal which in any case is only required in minute quantities (less than 0·005 per cent. of the diet). It may be added that one of the physical defects produced in the females by the manganese-free diet was poor development of the mammary glands, so that even if the young had had the chance to suckle they would not have grown properly. Whether these facts are of any practical interest in women is unknown, but their very existence illustrates in a striking way the importance and complexity of the problem of child-bearing and rearing. As a guidance to manganese distribution in foods, Orent and McCollum state that the manganese content of plant tissues ranges from 0·5 part per million to 10 parts per million and higher, and that of animal tissue from 0·1 to 5 parts per million.

Another metal which may prove to be of importance in the metabolism of pregnancy is magnesium. The magnesium balance in pregnant women has been investigated by Hoffström,[1] but there is nothing of great interest in these results. It is, however, important to remember that nephritic changes have been produced in rats by magnesium-free diets (Cramer [18]) and, although these results have not been extended to man, there is always a possibility that magnesium may be of some special significance in times of metabolic stress as in pregnancy.

Iodine and Thyroid Hyperplasia

Iodine is of importance both to mother and offspring. The normal thyroid gland of an adult woman contains about 8 mg. of iodine. There is some iodine in the blood (about 0·01 mg. per 100 c.cm.) chiefly in organic combination. It is probably safe to assume that the whole body of the average healthy adult contains about 10 to 15 mg. of the element, and that of a new-born baby about 0·15 to 0·3 mg. It would appear, therefore, that there is no difficulty under ordinary conditions for the fœtus to get a sufficiency of this substance. Although the transfer of iodine from mother to fœtus is, as far as we know, not a problem of any great practical importance in this country, it is in some countries. What I wish to emphasise here is the great significance of these traces of iodine in early life. Until recent years endemic cretinism has been very common in some of the Swiss cantons. With the addition of iodide to the salt in the proportion of 1 of KI in 100,000 of NaCl endemic cretinism in Switzerland has been greatly reduced. In fact, Hunziker and Eggenberger [19] claim that endemic cretinism never appears in the offspring of women who, during the last five months of pregnancy, have taken iodine to the extent of 0·1 mg. (100 γ) daily in the form of iodised salt.

The problem of simple goitre is largely one of an insufficient supply of iodine during pregnancy and early life, and the larger the thyroid overgrowth, the more likely is it that the iodine deficiency began in utero. I should like to give some of my own experimental evidence on this point. A diet consisting of milk, bread, and meat has a very low iodine content. If bitches are fed on such a diet during pregnancy and lactation under laboratory conditions the thyroids of the offspring on a similar diet become goitrous and of the hyperplastic type, devoid of colloid, and with a large blood-supply. The goitres of the puppies in the first litter may not be large, but if this diet is continued over subsequent pregnancies the maternal organism finds it more and more difficult to supply from her stores even the minute quantity necessary to produce normal development of the thyroid, and the goitre in the offspring becomes larger and larger. The following experiment illustrates this fact, but as it was carried out with additional objects than the one under review some of the data, as, for instance, the length of life of the puppies, are not comparable. In interpreting the data due allowance for this must be made.

The diet of a bitch throughout a period of four years was composed of separated milk, bread, meat, cabbage, and irradiated olive oil. This diet has a very low iodine content. During the four years 6 litters were born and the puppies were brought up on diets of similar, but not identical, constitution to that of the mother and were deficient in iodine. In Table III. the effect of this diet on the size of the thyroids of the offspring is shown. For guidance, it may be added that the average weight of the thyroid glands of normal dogs generally varies from 1 to 4 g.

TABLE III.—*The production of large goitres in young dogs by withholding iodine from the mother during pregnancy and early life*

Litter.	Size of puppies' thyroids at weaning.	Average weight in grammes of thyroids of offspring at death.	Age of offspring at death.	Puppies in litter.
1st	Large.	23	6 months.	4
2nd	Very large.	230	2½ years.	4
3rd	,, ,,	55	5 months.	3
The bitch was given five doses of 0·2 g. potassium iodide between the 3rd and 4th litters.				
4th	Small.	6	10 months.	5
5th	,,	7	1½ years.	4
6th	,,	7	12 months (2) 2 still alive.	4

It will be seen how very large may be the goitres produced by this method of feeding and how effective the giving of iodine to the mother is in reducing the glands in subsequent litters. No doubt this natural store of iodine will be used up in subsequent pregnancies, with the production again of large goitres.

The commoner foodstuffs such as milk, meat, bread, and cabbage are far too deficient in iodine to protect the mother and the offspring from the consequences of iodine deficiency. It may be asked—what food will supply sufficient iodine to prevent these effects? The answer is, sea fish or any kind of living matter from the sea, including that popular remedy cod-liver oil. Sea fish ought to be included in the diet of all pregnant women—say twice a week—and with this inclusion and the giving of cod-liver oil to the child after birth, all danger of simple goitre will be avoided. Although the quantity of iodine in the body necessary to bring about perfect development and function of the thyroid is small and is measured in milligrammes, I would emphasise that the iodine content of most of the ordinary foods is also minute and is measured in a few thousandths of a milligramme. Sea fish is the only real exception. There is still in this country a great deal of simple goitre, and although iodine deficiency is probably not the only factor causing simple goitre, it is by far the most important, and a sufficiency of iodine intake especially during intra-uterine life and the period of

growth would probably eliminate this condition from the community. I believe a sufficiency of iodine (i.e., about 100 γ or 0·1 mg. daily) taken during early life and the period of growth is the outstanding necessity in thyroid physiology.

A few more points relating to iodine in pregnancy may be briefly noted:

(1) Although great iodine deficiency in pregnancy results in endemic cretinism in the offspring, there is no evidence that the same deficiency is in any way responsible for sporadic cretinism—the type commonly seen in this country.

(2) Simple goitre may follow numerous pregnancies in a mother owing to the call of the fœtus on her own stores.

(3) Myxœdema sometimes follows numerous pregnancies in a mother and may be partially related to iodine deficiency, but this explanation is not established.

(4) A great exacerbation of hyperthyroidism is liable to occur during pregnancy in women with hyperthyroidism treated with iodine.

Fat-soluble Vitamins and Puerperal Sepsis

When young rats are brought up on a diet complete so far as is known except for vitamin A, they develop multiple septic foci and die. All kinds of infective lesions are found post mortem, but the most common are abscesses in the floor of the mouth, middle-ear disease and septic nasal sinuses, infections of the respiratory, genito-urinary, and alimentary tracts. The lesions begin in mucous membranes. When some substance containing vitamin A or carotene is given, these lesions are prevented or, if already present, are in most cases cured. Because of these experimental results Green and I called vitamin A the anti-infective vitamin.[20] It was natural to assume that the experimental results might have some bearing on infective conditions in human beings, and in order to test this hypothesis we made a large scale inquiry on pregnant women to see whether this form of prophylactic therapy would reduce puerperal sepsis (Green, Pindar, Davis, and Mellanby[21]).

In this test 550 women attending the antenatal clinics in Sheffield were investigated. Alternate women (275) were given a supply of a preparation rich in vitamins A and D during the last month of pregnancy; the remaining women had none of the vitamin supplement. No vitamin preparation was given to any of the women after their entry into the lying-in hospital. No general instructions as to dietary were issued in the antenatal period. At full term the women were brought into hospital and delivered, the attending doctors or staff having no knowledge as to previous therapy. After discharge from hospital, all the notes were collected and analysed. The results were as follows:—

In the vitamin group, the morbidity-rate in the puerperium, using the B.M.A. standard, was 1·1 per cent. In the control group the corresponding figure was 4·7 per cent. The difference, 3·6 per cent., is over twice the standard error (1·4) and therefore statistically significant.

At one hospital where over 400 of the cases were delivered the morbidity-rate in the vitamin-treated group was 1·0 per cent. as compared with 5·8 per cent. in the untreated group. These rates compare with 7·3, 8·1, and 5·0 per cent. in the total antenatal cases delivered in this hospital in the three years prior to the beginning of this investigation.

When the morbid cases were classified, not under the B.M.A. standard, but on the notifiable standard (Public Health Regulations), the difference in the morbidity-rates between the two groups was not so great, being 4·0 per cent. in the vitamin group and 5·5 per cent. in the controls. This means that later in the puerperium—i.e., after the first 10 days—possibly owing to the using up of the vitamin or other nutritional reserves (vitamin therapy stopped on admission), some of the vitamin group developed sepsis. However, even so, the difference between the severity of the disease in the two groups was very great; thus only 12 cases were classed as clinically severe in the vitamin group and 26 in the control group.

The general result of the investigation suggests that this form of therapy, in which probably the most important factor is vitamin A, increases the resistance of the genito-urinary tract to invasion by micro-organisms when given before birth; it seems probable that the resistance would be still greater if the vitamin were given over a longer period. These clinical tests were made because of the observation in animals that vitamin-A deficiency increases the susceptibility of mucous membranes to infection. In order to strengthen the experimental basis it may be well to describe some tests carried out by H. N. Green (unpublished) in my laboratory on this specific question of infection of the generative organs and its relation to nutrition.

Three groups of does (rats) were placed on a standard basal diet which is vitamin-A deficient (Green and Mellanby, 1928[20]). When pregnant, each rat was separated and maintained on the same diet until delivered; she was then returned to the communal cage. In group 1, only 5 out of 13 became pregnant and had litters which in each case were either born dead or were eaten soon after birth. All 13 does died of infection. In the 8 non-pregnant, infection was mainly localised in the lungs. In the 5 which bore litters the genito-urinary organs were infected and in 3 cases there was chronic infection of the uterus in the form of pyometra.

In group 2, it was decided to give a diet relatively, rather than completely, deficient in vitamin A, for it was thought that a greater percentage of pregnant animals with more families ought to be obtained than in the first group. Cabbage was given for one week in every three weeks over a period of 21 weeks and then the supplement was discontinued. Four of the seven does bore litters, but in only one case was there a second litter. All the does died of severe infection of some organs and 2 of the 4 after being pregnant died from chronic septic lesions of the generative organs.

In group 3, 2 g. of cabbage were given daily, in addition to the basal vitamin-A deficient diet to 9 does. In every case the rat became pregnant, more than one litter being born in most cases. Of these animals, on post-mortem examination, 8 were found to be free from infection of the generative organs, 1 showed slight infection, 3 of the 9 had other forms of slight infection. Two control does were given cabbage ad lib. in addition to the same basal diet and after having had and brought up several litters were found to be completely free from infection. Since litters can be successfully reared on this basal diet if adequate amounts of cabbage are given, it is probable that 2 g. of moist cabbage daily did not contain quite enough carotene to allow perfect health. The vitamin-A content of the livers of group 3 was found to be low. This feeding experiment shows the necessity for an increased vitamin-A intake during pregnancy, for in non-pregnant rats the amount (2 g.) of cabbage is sufficient for maintaining health.

These three groups of experiments show that the mucosa of a parous uterus is more susceptible to infection when the diet is relatively deficient in vitamin A or carotene during and after pregnancy and are in keeping with the clinical results in women above described.

The experimental and clinical results on the relation of vitamin A to infection are therefore sufficiently suggestive to warrant the belief that nutrition in pregnancy bears some relation to susceptibility to infection. Undoubtedly, however, there is a great deal more in this matter than the action of vitamin A. I find it difficult to believe, however, that puerperal sepsis will be solved on bacteriological lines alone. Rivett, Williams, Colebrook, and Fry[22] have recently made it clear that sepsis often follows normal and spontaneous delivery, without perineal or vaginal

lacerations and where no vaginal examination has ever been made. It seems to me essential that a woman's resistance to infection should also be taken into consideration, and since there is at least some evidence that proper feeding raises this resistance, this side of the problem ought to be studied and developed.

Summary

I have attempted to show why nutrition is the most important of all environmental factors in child-bearing, whether the problem be considered from the point of view of the mother or that of the offspring. Both may suffer severely under conditions of malnutrition.

Malnutrition in this sense does not mean an insufficiency of energy-bearing foods, but a deficiency of factors, usually only necessary in small amounts, which are nevertheless essential both to mother and offspring. There are probably a much larger number of such substances than are at present known but, confining myself to the known, I have shown that among these must be placed calcium, phosphorus, iodine, iron, and vitamins A and D. All these substances are likely to be absolutely or relatively deficient in the diet, especially among the poor who cannot afford the dearer protective foods. A deficiency in any of them produces undesirable results on mother and child.

It is unfortunate that there is no established clinical or experimental evidence that malnutrition is responsible for those toxæmias of pregnancy which include albuminuria, pre-eclamptic toxæmia, and eclampsia itself. In spite of the absence of such evidence I wish to plead that future investigators of these problems will give some attention to this aspect of the case. The hypothesis that such toxæmias are due to the production of toxic substances by the fœtus and placenta has not been fruitful. On the other hand, there is every indication that they are due to abnormal metabolism and, since so many defects in metabolism are now known to be nutritional in origin, the chances that such a factor is the basis of eclamptic conditions are large.

The final teaching based on the foregoing facts is that proper nutrition is essential to healthy child-bearing and that the diet should include throughout pregnancy and lactation a sufficiency of what are known as protective foodstuffs. When plenty of these are taken, there is every reason to believe that the rest of the diet will take care of itself.

As a general guidance, the diet of pregnancy and lactation ought to include :—

2 pints of milk daily.
1 or 2 substantial servings of green vegetables—cabbage, spinach, or lettuce, daily.
1 or 2 eggs or egg-yolks daily.
An apple or orange or some fresh fruit daily.
Sea fish twice or more a week.
Calf's liver once a week.
If cod-liver oil can be taken, 2 teaspoonfuls daily is advisable.

The rest of the diet can be made up as the woman wishes.

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THE CLINICAL APPLICATIONS OF DINITRO-O-CRESOL

BY E. C. DODDS, M.V.O., D.Sc., M.D., F.R.C.P. LOND.
COURTAULD PROFESSOR OF BIOCHEMISTRY IN THE UNIVERSITY OF LONDON; AND
J. D. ROBERTSON, M.D., D.P.H.
ASSISTANT CHEMICAL PATHOLOGIST TO THE MIDDLESEX HOSPITAL
(*From the Courtauld Institute of Biochemistry, Middlesex Hospital*)

I

THAT certain nitrophenols possess marked influence on metabolism has been known since 1885.[1] Little attention appears to have been paid to these first observations until the year 1928 when work was begun on this problem in Heymans's laboratory in Ghent.[2] From this date a series of publications has emanated from that laboratory indicating that certain nitrophenols are powerful stimulators of metabolism, causing a great increase in oxygen consumption, and, if the administration be pushed, a rise in temperature terminating in a fatal hyperpyrexia. Cutting, Mehrtens, and Tainter [3] described clinical experiments with 2 : 4-dinitrophenol. The compound was administered to patients in doses of 3 mg. per kg. body-weight, and it was found that there was a rise in basal metabolic rate unattended by toxic symptoms, and that it was possible by this means to reduce the weight of patients without simultaneous dietetic restrictions. In a preliminary communication Dodds and Pope [4] described another compound, 4 : 6-dinitro-o-cresol, indicating that this also possessed the power of increasing the basal metabolic rate but appeared from the pharmacological experiments to be more active than the 2 : 4-dinitrophenol.

The sole purpose of this communication is to establish a safe dosage for this compound in order that the basal metabolic rate may be maintained at a level above normal for long periods.

The substance was carefully purified and administered in the form of ordinary tablets coated with gelatin. It was previously found by animal experimentation that the substance exerts its effect when administered by mouth. The patients selected were either normal, healthy, young adults or young adults with varying degrees of obesity. The basal

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metabolic rate of the patients was observed frequently, employing the Benedict-Roth apparatus.

The first experiments were made employing 3 mg. per kg. body-weight per day. As can be seen from the charts, it was found that this dose was far too great, and it had to be discontinued after four days in view of the very severe toxic reaction. The second series of experiments was undertaken with a view to studying the effects of a single dose of 3 mg. per kg. body-weight. A third series of observations was made in an attempt to find the daily dose necessary to maintain the basal metabolic rate at a constant level between +30 and +50.

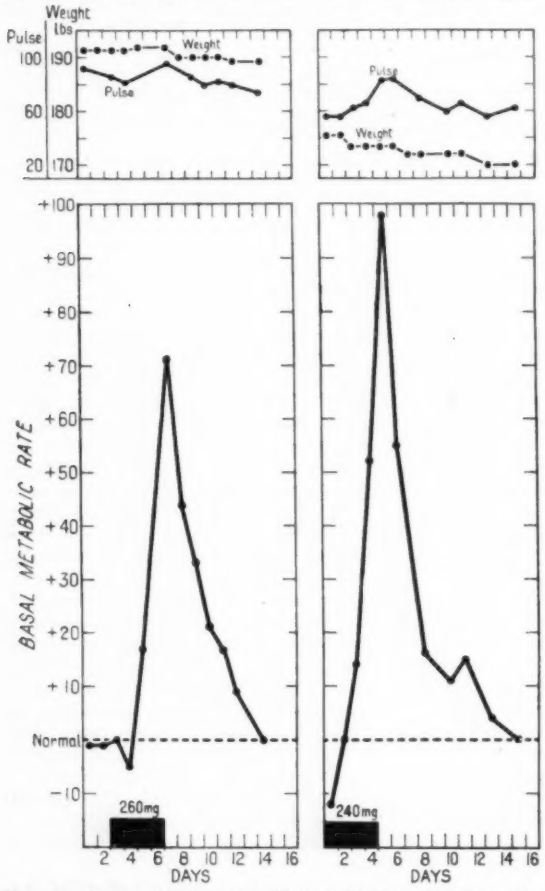

FIG. 1.—Charts showing the effect of dinitro-o-cresol on the basal metabolic rate, weight, and pulse-rate of two normal subjects. A dose of 3 mg. per kg. body-weight was given daily for several days.

Typical charts of two patients are reproduced. Fig. 1 shows the effect of administering the preparation, 3 mg. per kg. body-weight, over a period of a few days. In both cases by the third day the basal metabolic rate had reached an alarming height, in one instance showing nearly 100 per cent. increase. The administration of the preparation was stopped owing to the appearance of the toxic symptoms recounted later. The increase in basal metabolic rate was accompanied by a slight increase in the resting pulse-rate which, however, was not proportional to the height of metabolism. The temperature did not exceed 99° F., and there was no effect on the blood pressure. On withdrawal of the preparation the basal metabolic rate fell rapidly to normal. In Fig. 2 the effect of administering a single dose of 3 mg. per kg. body-weight is shown. There was a rapid rise in the metabolic rate, reaching a maximum within the first 24 hours, followed by a return to normal in four to five days. In Figs. 3 and 4 can be seen the effect of administering quantities of 50 to 100 mg. per day, or 0·5 to 1 mg. per kg. body-weight, over a prolonged period. It can be seen that the metabolic rate is maintained at a level above normal without the appearance of any symptoms whatsoever.

Toxic Symptoms.—It was found that when the basal metabolic rate exceeded +50 definite toxic symptoms appeared. These included sweating, lethargy with a desire to sleep during the day, and the impossibility of sleep during the night owing to sweating. This was accompanied by severe headache and loss of appetite, and in addition a definite pigmentation appeared on the conjunctivæ. This colour was of a greenish-yellow hue and was somewhat similar to, but not identical with, that of the early stages of jaundice. Careful examination of the blood and urine failed to reveal the presence of bile-pigments.

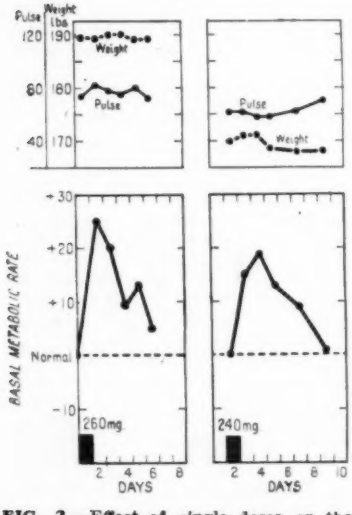

FIG. 2.—Effect of single doses on the basal metabolic rate, weight, and pulse-rate of two normal subjects.

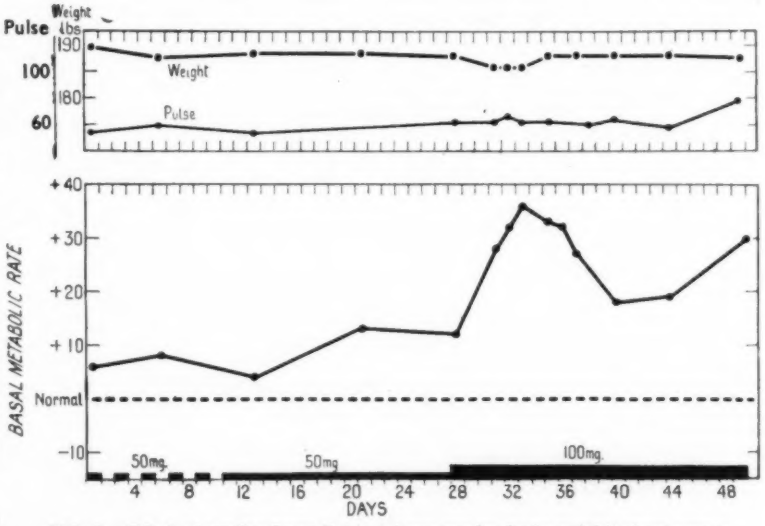

FIG. 3.—Effect of smaller doses (0·5 to 1·0 mg. per kg. body-weight) given over a longer period.

Conclusions.—These results indicate the extremely powerful action of bodies of this group and consequently the extreme caution with which their administration must be attended. A safe dose which will cause a definite increase in basal metabolic rate would appear to lie between 50 and 100 mg. per day for a normal person, or 0·5 to 1·0 mg. per kg. body-weight. Under no circumstances should the compound be administered in such quantities as to raise the basal metabolic rate above +50, as otherwise grave discomfort and danger will result. It must also be borne in mind that neither the pulse-rate nor the blood pressure are of any value in assessing the basal metabolic rate, since the characteristic action of this compound is an increase in metabolism without a proportionate stimulation of the cardio-vascular system such as occurs with the administration of thyroxine. Any attempt, therefore, to arrive at the basal metabolic rate by the use of Read's formula would give misleading results. It would appear, therefore, that the action of the drug should always be checked by determination of the basal metabolic rate.

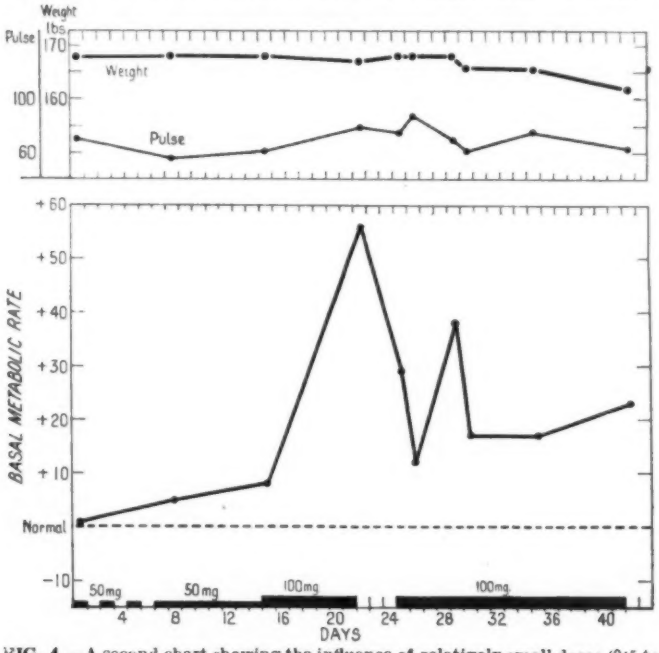

FIG. 4.—A second chart showing the influence of relatively small doses (0·5 to 1·0 mg. per kg.) on the basal metabolic rate, weight, and pulse-rate of a normal subject.

These experiments show that it is possible to maintain the metabolic rate at a figure some 30 to 50 per cent. above normal without the appearance of any discomfort or toxic symptoms. It follows that, provided the diet be not grossly in excess of the person's requirements, weight will be lost, and it is possible to adjust the intake so that a steady loss of weight results. This will be possible without undue privation. A series of such cases is at present under examination.

It would appear that dinitro-ortho-cresol is in the region of five times as potent as the dinitro-phenol compound as judged by clinical observations.

We have to thank British Colloids Ltd. for supplies of the dinitro-o-cresol, and also for a grant towards the expenses of this investigation.

(*References at foot of next column*)

ACHOLURIC JAUNDICE
WITH INCREASED FRAGILITY OF THE RED BLOOD CORPUSCLES APPEARING AFTER SPLENECTOMY

BY A. P. THOMSON, *M.C.*, M.D. BIRM., F.R.C.P. LOND.
PHYSICIAN TO THE GENERAL HOSPITAL, BIRMINGHAM

THE following case is recorded because I believe that patients with obscure illness associated with enlargement of the spleen and jaundice but without evidence of increased fragility of the red blood-cells or of serious hæmolysis may at times miss the benefit of splenectomy. The history of my patient warrants the conclusion that examinations of the blood both in respect of fragility and reticulocytosis must be repeated many times before the diagnosis of acholuric jaundice may justly be excluded.

CASE RECORD

A young man of 18, by trade a blacksmith, was referred to Dr. J. M. Smellie in the out-patient department of the General Hospital on July 1st, 1930, by Dr. F. M. Smith, of Quarry Bank, Staffordshire. He had had an attack of jaundice three months previously which had cleared up slowly; subsequently he had vague digestive symptoms, and his spleen was found to be enlarged. A radiogram of the stomach and duodenum was normal and the blood count revealed a secondary anæmia with normal fragility of the red blood corpuscles.

He was one of a family of four children; two sisters were quite healthy, but another had died from spinal tuberculosis. His father had died of cancer, and his mother was alive and well. Prior to the attack of jaundice the patient had been strong and healthy.

For a period of two years he was treated symptomatically at home for vague ill-health, the prominent features of which were progressive weakness, poor appetite, and unlocalised abdominal pain not particularly related to food.

In June, 1932, he again saw Dr. Smellie in the out-patient department; his spleen was found to be enlarged as far down as the umbilicus, but there was no enlargement of the liver and the blood count revealed a secondary anæmia and a leucopenia. There was no jaundice. He was admitted to the wards with a tentative diagnosis of Banti's disease. After admission his Wassermann reaction was found to be negative and no evidence of tuberculosis was discovered. Three weeks later, after an attack of colicky abdominal pain, he developed jaundice and bile appeared in the urine. In the course of the next month he became extremely ill, wasting was marked, and he had the usual symptoms associated with cholæmia. There was no ascites and the leucopenia was less than it had been on admission. The van den Bergh test was carried out twice—12 days before the appearance of the jaundice, when the direct reaction was negative and the indirect was only doubtfully positive; after the jaundice appeared

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SUMMARY OF LABORATORY FINDINGS

Date.	Hæmoglobin.	R.B.C. (millions).	W.B.C. (thousands).	Polymorphs (per cent.).	Lymphocytes (per cent.).	Mononucleears, &c. (per cent.).	Reticulocytes (per 1000).	Fragility saline (per cent.).	Van den Bergh.	Notes.
1930. July 1st..	56	4·7	6·2	71	23	6	..	0·55–0·40	..	B. film normal. Spleen + 3 months after first attack of jaundice—vague dyspepsia—X ray stomach and duodenum normal.
1932. June 2nd	62	4·0	1·4	67	20	13	..	..	..	Spleen enlarged to umbilicus. † Banti. B. film normal.
„ 14th	..	..	..	..	..	..	..	0·50–0·20	Direct neg. Indirect doubtful pos.	Wassermann negative. No T.B. in fæces.
„ 18th	Attack of colicky abdominal pain.									
„ 26th	Onset of jaundice. Bile noticed in urine.									
July 29th	75	4·2	2·8	59	37	4	34	..	Biphasic +	Deeply jaundiced, cholæmic. No ascites.
Aug. 6th	..	4·2	..	..	..	..	4	..	..	
„ 11th	Splenectomy. Weight of spleen 2 lb. 2 oz. = 1020 grammes.									
„ 31st	..	..	14·3	79	14	7	..	..	..	—
Sept. 12th	72	4·4	10·2	66	20	14	..	0·65–0·25	Direct and indirect neg.	—
Oct. 16th	59	3·9	15·4	67	18	15	11	0·65–0·25	..	Some anisocytosis.
1933. April 5th	Price-Jones curve normal (Dr. W. C. Smallwood).									—
Oct. 3rd	78	3·8	9·6	63	27	10	15	0·55–0·25	Direct neg. Indirect pos.	—

it gave a strong positive biphasic reaction. The fragility of the red corpuscles was estimated again about a fortnight before the jaundice appeared, and the range was normal (0·50 per cent. to 0·20 per cent. saline). At no time was there any ascites, and physical examination was consistently negative, apart from the considerable enlargement of the spleen and the jaundice. The anæmia was never profound but on July 29th, 1932, examination of his blood showed a definite reticulocytosis (34 reticulocytes per 1000 red cells), for which there was no apparent cause (he had not received any form of liver treatment or any known stimulant to the bone-marrow). The reticulocytosis proved to be transitory; it had disappeared eight days later, and it was the only evidence to support the diagnosis of acholuric jaundice, but in view of the rapid deterioration of his general condition, for he now appeared to be fatally ill, it was decided to treat the patient surgically.

On August 11th, 1932, splenectomy was carried out by Mr. H. H. Sampson. The operation was difficult owing to adhesions and the gross enlargement of the spleen; after removal its weight was found to be 1020 g., but its size has been very considerably diminished by gentle pressure. Convalescence was good; the jaundice disappeared in the course of three weeks, and one month after the operation the van den Bergh was completely negative, both direct and indirect reactions. At this time it was found that the fragility of the red blood corpuscles had actually increased and now showed a range of 0·40 saline (from 0·65 to 0·25). There was slight secondary anæmia, but actually a leucocytosis was present (10,200 cells). The man appeared well and was discharged.

Dr. F. W. Mason Lamb, pathologist to the General Hospital, reported on the section from the spleen as follows: "The lymph follicles are diminished in size and number. Areas of hæmorrhage and of fibrosis are present. Most of the cells of the pulp have disappeared and the splenic sinuses are therefore much more prominent than usual. The endothelium lining the sinuses shows some tendency to proliferation and degeneration. The changes seen are those generally associated with acholuric jaundice."

Nearly three months after the operation he came to me in the out-patient department, apparently well; examination of his blood showed increased fragility of the red blood corpuscles of the same degree—range 0·40 saline (0·65 to 0·25), and a moderate anæmia.

In April, 1933, a Price-Jones curve (Dr. W. Carey Smallwood) was normal. In October, 1933, I saw the man again as an out-patient; his general condition was good, he had been working regularly and said he felt better than he had ever been prior to the operation. The blood count showed a slight anæmia; fragility was normal; the van den Bergh gave a negative direct and slightly positive indirect reaction. A summary of the laboratory findings is given in the accompanying Table.

DISCUSSION

Cases of acholuric jaundice may present great difficulties in diagnosis for, as Lord Dawson[1] has pointed out, jaundice may be inconspicuous or even absent and the only outstanding feature may be unexplained anæmia. In most cases, fortunately, there is evidence of increased fragility of the red blood corpuscles, which gives a clue to the diagnosis; it is well known however that this fragility may vary in degree not only in different patients but also at different times in the same case. In my patient there was no evidence of increased fragility in the two examinations carried out before the operation, and the second of these was done only a fortnight before the onset of acute illness.

Reticulocytosis of considerable degree is an important feature of many cases of acholuric jaundice, but in the case recorded it was found only once, on July 29th, 1932; it was slight in amount (3·4 per cent.) and had disappeared a week later; on this admittedly slender evidence the decision in favour of operation turned. The effect of splenectomy on fragility is variable; according to Dawson it remains unchanged in half the cases, and is reduced in the remainder. In his paper he mentions in a footnote one case, unpublished, in which it had been found that the fragility increased after operation. So far as I am aware, the history of my patient is the only one of this type to have been put on record. It is difficult to suggest a completely satisfactory explanation of the unusual course of this case; provisionally I accept the simplest as the most likely to be true.

[1] Brit. Med. Jour., 1931, i., 963.

It seems to me that it is possible that when hæmolysis in the spleen is very active all fragile corpuscles may be removed as soon as they enter the blood stream from the bone-marrow, and that consequently the estimated fragility of the blood removed from a vein may remain normal. After splenectomy fragile corpuscles may circulate in the blood stream, as they will not be removed by the spleen and the general fragility of the red blood corpuscles in the peripheral circulation will therefore be increased. If this be the true explanation, I should have expected the anæmia to have been more profound in my case and I can only assume that the proportion of fragile corpuscles produced was not great.

DIPHTHERIA IN HULL
AND ITS RELATION TO BACTERIOLOGICAL TYPE

By H. Mason Leete, M.D. Durh., D.P.H.
Medical Superintendent of the Hull City Isolation Hospitals

J. W. McLeod, M.B. Glasg., F.R.S.
Professor of Bacteriology in the University of Leeds; and

Andrew C. Morrison, M.D. Glasg. D.P.H.
Resident Medical Officer, Hull City Hospital, Cottingham

Diphtheria in Hull has been particularly severe during the past three years. Graham Forbes [1] in his recent survey of diphtheria in England and Wales draws attention to this fact and shows that in 1931 and 1932 the city had an unusually high incidence and mortality compared with the county boroughs of the northern area. His figures for 1931 are as follows:—

	Incidence per 1000.	Deaths per 100,000.
All County Boroughs ..	1·54	9·8
Hull	3·6	30·8

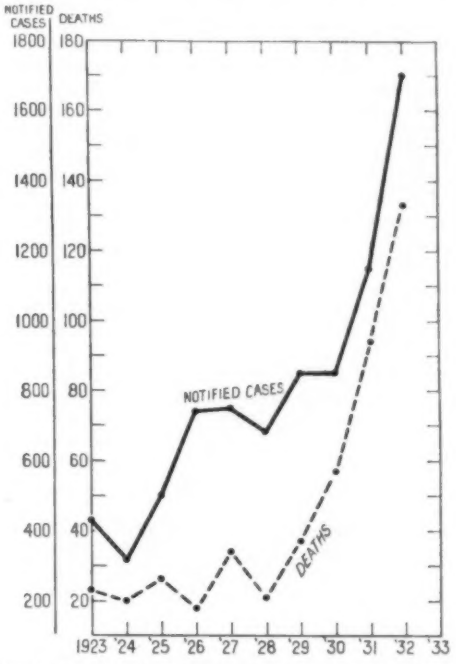
The incidence and mortality in Hull for the past ten years are shown in graphical form in the accompanying Figure, from which it appears that some unusual factor has been at work since about 1929. The figures on which the graph is based are as the following:—

Year.	Notifications.	Deaths	Year.	Notifications.	Deaths
1923 ..	421 ..	23	1928 ..	674 ..	21
1924 ..	321 ..	20	1929 ..	852 ..	37
1925 ..	498 ..	26	1930 ..	856 ..	47
1926 ..	742 ..	18	1931 ..	1145 ..	94
1927 ..	747 ..	34	1932 ..	1707 ..	133

Considering our cases during the past three years from the clinical standpoint, we formed the impression that certain of them were unusually severe. About October, 1930, our attention was drawn to some toxic cases where the general toxæmia was out of all relation to the throat lesion. Despite what appeared to be an adequate dose of antitoxin administered during a reasonably early stage, say on the second day, the disease progressed steadily, cervical adenitis became more marked, toxæmia increased, and death took place between the fourth and tenth day of the disease. An extreme example of such a case is the following:—

History.—The patient, a boy 9 years old, had previously been healthy, with no illnesses of importance. On May 28th he was active, ate well, and seemed normal in every way. On the 29th he got up and dressed, but did not feel well, and vomited. Swelling in the neck was noted, but he did not complain of his throat. On May 30th the child was worse, and the neck more swollen. A doctor was sent for, the case was notified, and the patient admitted to hospital at 4.30 P.M.

Condition on admission.—Child exceedingly ill. Moribund. Throat shows extensive recent membrane over tonsils and fauces, most marked on the left side where it stretches up almost to the hard palate. Patient was semiconscious, restless, and cyanosed; breath intensely fœtid and copious nasal discharge. Extreme enlargement left side of neck due to periadenitis. Pulse very weak. Died 9.30 P.M. This child was obviously dying of acute



Number of diphtheria cases and deaths notified in Hull during the years 1923–32.

toxæmia and there were no indications for antitoxin or any other treatment.

Bacteriology.—Swabs from throat and nose were found positive. The organism was isolated in pure culture and found to be of the gravis type.

Such toxic cases, up till then rare and disturbing exceptions, increased in number during 1931, till in the winter 1931–32 they became relatively common. It was therefore thought desirable to investigate the cases to ascertain the relationship between the clinical type of disease and the types of diphtheria bacilli previously differentiated in Leeds.[2 3]

METHODS OF INVESTIGATION

It was decided to examine all cases which could be regarded as clinical diphtheria, omitting the obviously septic cases which were sent in as diphtheria, and also carriers. Cases of doubtful clinical diphtheria were regarded as material for the investigation and were only rejected if the cultures showed no diphtheria bacilli.

Swabs were taken by one of us in the morning and sent at once by train to Leeds, where they were investigated by the technique described by Anderson, Happold, McLeod, and Thomson.[2] In certain cases organisms were isolated from the parallel routine swabs and tested in the hospital laboratory for starch fermentation. These numbered 100, and with one exception the results obtained in the two laboratories were identical. This finding is discussed in detail later. Omitting the Leeds negative findings, which

corresponded in almost every case with three successive negative findings on Löffler's serum medium in Hull, we were left with 310 cases of clinical and bacteriologically typed diphtheria of all grades of severity. These comprised practically all the established diphtheria cases admitted during November and December, 1932, and January and February, 1933, with the exception of a short interval at Christmas. The findings are therefore a thoroughly representative sample of Hull diphtheria as we have known it recently.

We classified our cases on admission as mild, moderate, or severe. By "mild" cases we mean those showing slight lesions on one or both tonsils without adenitis or toxæmia. Our antitoxin dosage for such cases ranges from 4000 to 8000 units. "Moderate" cases showed extensive membrane formation on one or both tonsils with perhaps slight adenitis but no marked toxæmia. The antitoxin dosage was in the neighbourhood of 16,000 units. "Severe" cases showed membrane formation involving fauces, soft palate, and uvula, with marked adenitis and toxæmia. Antitoxin dosage in this group of severe cases varied from 24,000 to 88,000 units, some portion of the dose always being given intravenously within an hour of admission. The average dose was approximately 40,000 units.

In a small group of some 15 toxic cases previously dealt with and not included in the series under discussion, we had given doses of serum varying from 100,000 to 180,000 units. The results were not appreciably different from those obtained with the smaller dosage mentioned.

In considering the results we have adhered to the classification on admission except that we have extracted the fatal cases, almost all of which were classified as "severe" on admission.

TABLE I.—*Clinical severity and type distribution of 310 cases*

—	Gravis.	Intermediate	Mitis.	Atypical.	Double infection*	Total.
Mild ..	56 (1)	20	14	3	1	94(1)
Moderate	58 (4)	41(1)	9(1	2	1	111(6)
Severe ..	31(15)	22(7)	2	2	—	57(22)
Fatal ..	35	5	1	—	—	41
Laryngeal	4	2	1	—	—	7
All cases	184(20)	90(8)	27(1)	7	2	310(29)

* These were infections with mitis and intermediate strains.
The numbers in parentheses indicate the number of cases in each group which showed typical diphtheritic paralyses.

TABLE II.—*Results from Table I. expressed in percentages. Faucial cases (303) only*

—	Gravis.	Intermediate.	Mitis.	Atypical.	Double infection.
Mild ..	59·6	21·2	15·0	3·2	1·0
Moderate ..	52·2	37·0	8·1	1·8	0·9
Severe ..	54·4	38·6	3·5	3·5	—
Fatal ..	85·4	12·2	2·4	—	—
All cases ..	59·4	29·0	8·7	2·3	0·6

TABLE III.—*Percentage incidence of paralysis and case-mortality in faucial cases*

—	Gravis.	Intermediate.	Mitis.
Paralysis incidence ..	11·1	9·1	3·8
Case-mortality rate ..	19·4	5·7	3·8

Table I. summarises our findings, while Tables II. and III. express them in percentage form. All the deaths, with the exception of the mitis death, were toxic deaths.

The death under the mitis heading was due to broncho-pneumonia; a typical attack of severe broncho-pneumonia complicating a case of faucial diphtheria of moderate severity in a child aged two years. It was not a toxic diphtheria death in the sense in which all the other fatal cases can be understood. In a case not included in our series, an organism of mitis type was isolated from the throat of a child aged five years who had been ill for several weeks with broncho-pneumonia and who died from that disease. The throat was somewhat ulcerated and he had been swabbed before admission. Despite the throat lesion we thought that the case was probably a carrier and the organism was found to be non-pathogenic to animals.

It will be seen from these figures that there is a high proportion of gravis infection in Hull, almost 60 per cent. of all cases showing the starch-fermenting strain of diphtheria bacillus. The next most important strain is the intermediate (29 per cent.), while mitis strains account for only 9 per cent. of the total infections.

The high percentage of gravis infection in cases classified as clinically mild is interesting. We would suggest that this indicates a partial immunity in the subjects attacked. We are of the opinion that clinical severity in diphtheria is probably more dependent on individual partial immunity than on other factors such as virulence and infective dose.

The number of toxic deaths (40) in this series of 303 faucial cases is large, and it is seen that 87 per cent. of these deaths were due to an organism of the gravis type.

Our experience in Hull is, therefore, that the great majority of fatal toxic cases are due to a starch-fermenting bacillus which differs from the gravis type found in Leeds only in minor points detailed later in this paper. It will be noted that this organism is also found in a considerable number of mild and moderate infections. It therefore follows that it is only possible to postulate a gravis infection from a consideration of the clinical symptoms in the more acute and toxic cases.

An interesting point has emerged as to the intermediate type of organism. Though described originally as "intermediate" on bacteriological grounds, it seems to be intermediate in clinical significance as far as Hull is concerned. Our 88 intermediate faucial cases show a 9·1 per cent. incidence of paralysis and a 5·7 per cent. case-mortality rate against 11·1 per cent. and 19·4 per cent. respectively for the gravis infection. The paralysis rates do not show such a marked contrast as the mortality-rates, but this is partly explained by the fact that the intermediate cases showed a proportionately greater number of survivors to exhibit paralysis.

It should be noted that in the groups we have classified as moderate and severe the relative proportion of intermediate infection is appreciably greater than in the two extremes of severity—the mild cases and the fatal toxic cases.

The incidence of mitis infection is low. These cases for the most part were mild and the solitary death was due to broncho-pneumonia. The numbers are too small for useful discussion.

From the clinical standpoint the striking feature is the toxic nature of the severe gravis cases. We have seen many cases which have died of toxæmia despite antitoxin dosage of 60,000 units or more, part of the dose being given intravenously on admission, and some of these cases were admitted on the second day of disease. It is not surprising that clinicians faced with these cases have doubted the efficacy of antitoxin and suggested that existing antitoxins do not

neutralise gravis toxin; but the occurrence of large numbers of mild gravis cases, and the usual efficacy of measures taken to protect by active and passive immunity persons in contact with gravis infection, do not support this view.

Also the experimental work of Parish, Whatley, and O'Brien [4] and that of Povitzky, Eisner, and Jackson [5] is opposed to a theory formulating a different toxin. The last-named differ from the former in finding that when serum was administered late they could not control gravis infections in the guinea-pig as readily as they could infections with other diphtheria strains. The most probable explanation of these observations appears to be that the gravis strains invade the tissues more vigorously and that increased speed of absorption and fixation of toxin follow, a fatal dose being often absorbed within 48 hours and sometimes within 24 hours of onset. The remedy seems to be an increasing use of the methods of active immunity that are available.

ANIMAL PATHOGENICITY OF THE STRAINS ISOLATED

The technique followed was to suspend an 18-hour culture on Löffler's medium in 4 c.cm. of 0·85 per cent. saline, and to inject 0·5 c.cm. of this suspension (¼th slope) to a rabbit intramuscularly (extensor muscles of thigh) and another 0·5 c.cm. to a guinea-pig subcutaneously in the anterior chest wall.

In all 67 strains were injected, including all the mitis and atypical strains. The results of these injections are given in Tables IV. and V., and indicate that the order of animal pathogenicity was gravis, atypical, intermediate, and mitis. This was suggested both by the number of pathogenic strains and by the evidence of power of persisting in the animal body as judged by percentage of recoveries from the site of injection at death.

TABLE IV

Type.	Strains injected.	Number failing to kill in dose used: (*a*) rabbit, (*b*) guinea-pig.		Percentage of weakly pathogenic strains.
		(*a*)	(*b*)	
Gravis ..	25	0	1	4·0
Atypical ..	8	1	1	12·5
Intermediate	12	1	3	25·0
Mitis ..	24	5	7	33·3

TABLE V.—*Percentages of animals from which strains could be obtained in cultures from site of infection at time of death*

Type.	Rabbit.		Guinea-pig.	
	Average interval in days till death.	Percentage of strains recovered.	Average interval in days till death.	Percentage in strains recovered.
Gravis ..	3·9	60	2·1	65
Atypical ..	6·8	71	3·5	43
Intermediate	5·1	63·5	3·8	22
Mitis ..	4·9	52·7	2·7	11·7

STABILITY OF TYPE

The types described as mitis and intermediate correspond exactly with those of which an account is given in the previous papers referring to diphtheria in Leeds.[2 3] The gravis type predominant in Hull differs from that most common in Leeds in two minor points: (*a*) it gives a finer, blacker, and less easily recognisable colony on the special tellurite medium recommended; (*b*) its growth in broth is associated with a less marked pellicle and more general turbidity.

The "atypical" strains were with one exception strains closely resembling the typical Hull gravis strain except in failing to ferment starch and glycogen. The question of type stability was judged in three ways:—

(*a*) Investigation of the property of starch fermentation on strains isolated independently at Hull and at Leeds from the same cases. There was one discrepancy in a hundred, a case starch-negative at Hull and starch-positive in Leeds. Repetition of test at Leeds three weeks later gave starch-negative, glycogen-positive, and repetition again after four months gave starch-negative, glycogen-negative. This strain was therefore classified with the atypical forms; it resembled gravis in all other respects, but the property of polysaccharide fermentation was weak.

(*b*) All strains recovered from animals at death were re-examined. The results were as follows: Twenty gravis strains recovered, and 10 of these both from rabbit and guinea-pig—all 30 true to type. Ten mitis strains recovered and 2 of these both from rabbit and guinea-pig—all 12 true to type. Eight intermediate and 1 from both rabbit and guinea-pig—all 9 true to type. Six atypical and 2 from both rabbit and guinea-pig—of these 5 were recovered unchanged, 2 were lost before completion of identification, and 1 showed a partial fermentation of starch.

(*c*) Thirty strains were retested in respect of their cultural qualities after periods varying from 4–9 months in subculture. No change was recorded.

The general conclusion seems to be that there is a marked general stability of type, but that a few strains hold the property of polysaccharide fermentation very precariously. The acquisition of this property by a mitis strain has never been observed.

OCCURRENCE OF MIXED TYPES IN PRIMARY CULTURES

This was observed twice. A brother and sister falling ill about the same time were both found to have colonies of mitis and of intermediate types in their cultures. The strains isolated from these colonies have remained true to type in subculture and have shown a remarkable similarity in their animal pathogenicity—i.e., both mitis strains have killed rabbit and guinea-pig, whereas both intermediate strains have killed rabbit after a week and have produced local lesion in the guinea-pig without killing it.

CONCLUSIONS

(1) We have demonstrated a heavy incidence of gravis infection in Hull diphtheria. Of a series of 310 cases of all grades of severity, 59 per cent. have shown this strain of diphtheria bacillus. This heavy incidence, we suggest, is the explanation of the high diphtheria morbidity and mortality recently experienced in Hull.

(2) Of the 40 toxic deaths in this series, 35 were due to gravis and 5 to intermediate strains.

(3) The striking feature of these gravis infections in a completely non-immune subject is the extremely rapid course of the toxæmia. The short time-interval between infection and toxin-fixation defeats the ordinary methods of recognition and treatment. This emphasises the importance of prophylaxis as being the best method of dealing with diphtheria.

(4) In Hull the intermediate type is intermediate in clinical severity. It is found in toxic and fatal cases, but to a less extent than is the gravis strain. In this respect the findings in Hull differ from those obtained in Leeds and some other places where the case-mortality from intermediate infection is considerably higher.

(5) The mitis organism is at present of scanty distribution in Hull and is associated with mild and non-toxic cases.

We wish to thank Dr. K. E. Cooper of the University of Leeds bacteriological department for his assistance

with the experimental work on animals. We wish also to express our thanks to the Medical Research Council for a grant from which the expenses of the investigation have been partly defrayed.

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A CASE OF THE SCHÖNLEIN-HENOCH SYNDROME

BY A. PINEY, M.D. BIRM., M.R.C.P. LOND.

ASSISTANT PHYSICIAN TO ST. MARY'S HOSPITAL FOR WOMEN AND CHILDREN, PLAISTOW

THE whole subject of the purpuric diseases is still in confusion, partly as the result of including a most heterogeneous collection of morbid conditions under this name. Such a definite malady as thrombocytopenic purpura (Werlhof's disease) is now often recognised, but the less clearly classified diseases, such as the purpura rheumatica (Schönlein's disease) and purpura abdominalis (Henoch's disease) of older writers, are often forgotten. Every student learns that Henoch's purpura may be mistaken for an intussusception, and, as a rule, he also hears that Schönlein's disease is not related to rheumatism; it is, however, rare for him to know any more about these conditions, which are, therefore, often overlooked.

The case to be recorded here shows how peculiar the clinical features may be, and also demonstrates that the two maladies are intimately related to one another.

A boy, aged 7, was admitted to one of my beds, having been sent as a case of subacute rheumatism.

The *history* was that he had had a septic spot on the back of the right knee three weeks earlier. The knee became swollen, but improved with fomentations. A few days later the left knee was painful and swollen, and a week after the first swelling had occurred a "purpuric" rash was noticed. He was treated as a case of subacute rheumatism, and for ten days pains flitted from joint to joint, the rash still being present, although some spots faded whilst fresh ones appeared. Three days before admission the boy complained of sudden intense pain about the umbilicus, and vomited. Two days later the motions were seen to be streaked with blood and were very offensive.

On *admission* the striking feature was the peculiar "purpuric" rash, which was most intense on the dependent parts and on the back, particularly the buttocks. The individual spots varied in colour from purple to light brown; none were larger than a pea, but in places they were so close as to become confluent. The brownish spots were level with the skin surface, but the purple ones were slightly raised. On close inspection it was clear that each spot consisted of a minute reddish centre, surrounded by a slightly raised zone. It was striking that none of the colour changes characteristic of a bruise occurred during the fading of the eruption.

The heart was slightly enlarged and there was a blowing systolic bruit audible in all areas. The urine contained a faint trace of albumin, but no blood or casts.

Course of Illness.—Next day the spots were far more numerous, the scrotum, penis, ankles, and feet being specially affected. Two days later the child woke in the morning with intense œdema of the forehead and eyelids. The urine now contained a large number of red corpuscles and much albumin, but no casts. Within a few days the blood disappeared, but albuminuria persisted, although in decreasing amount, for over a fortnight. The œdema lasted for only five days.

At the time when the "purpuric" spots were most numerous the blood showed:—

Red corpuscles (per c.mm.)	4,150,000	Neutrophils (per cent.)— (band forms 3·7) (polymorphs 76·3)	= 80
Leucocytes (per c.mm.)	26,100	Monocytes (per cent.)	10
Hæmoglobin index	80	Lymphocytes (per cent.)	10

The Arneth count was not shifted to the left, and there were 265,000 platelets per c.mm.

It was clear that this was not a case of thrombocytopenic purpura (Werlhof's disease), and, indeed, quite apart from the normal number of platelets, the clinical characters of the eruption were very different from those of simple purpura.

On three successive days an intramuscular injection of 3 c.cm. of calcium gluconate was given and for four days no fresh spots appeared, but then a fresh crop came out. The treatment was repeated in a week and again there followed a period of four days without any fresh eruption. When the new crop of spots appeared an injection of horse serum was given, but it had no effect.

Another attack of severe abdominal pain, with blood in the motions, now occurred. The belly was tender just over the umbilicus, and for a few hours there was intense pain. The tenderness on pressure persisted for a week. Two drachms of calcium gluconate were given by mouth three times a day for a week, and during the same time parathyroid extract gr. $\frac{1}{15}$ was given each morning. No fresh spots appeared for a week, and the boy was, therefore, allowed to get up. A few fresh spots then appeared around the ankles, but after the first day there were no more new ones. Uninterrupted recovery now took place.

This case is recorded in order to show the diagnostic difficulties and to emphasise that this is a form of "purpura" entirely due to abnormal permeability of capillary walls. The urticarial characters of the rash strongly support Glanzmann's contention that Schönlein's and Henoch's disease should be classified together as "anaphylactoid purpura." The fact that the successful treatment was of the type that is applicable to allergic conditions also supports this view.

Further, the case shows clearly that the hæmorrhages that may occur in the Schönlein-Henoch syndrome are not due to simple bleeding, but to a true inflammatory lesion, such as nephritis or colitis.

CEREBRAL ANGIOGRAPHY

ITS APPLICATION IN CLINICAL PRACTICE AND PHYSIOLOGY

BY EGAS MONIZ

PROFESSOR OF NEUROLOGY, UNIVERSITY OF LISBON

CEREBRAL angiograms are obtained by means of a thorotrast injection of 10 to 16 c.cm. in the inferior part of the common carotid, between the two parts of the sterno-cleido-mastoideus. The arteriogram is a most important aid in the diagnosis of brain tumours. In order to obtain one it is necessary to produce a flash from the X ray tube a moment after the injection of 10 to 12 c.cm. of thorotrast.

If we continue to inject up to 16 c.cm., another radiogram at an interval of four seconds shows the veins and sinuses of the brain. This phlebogram is taken with the same injection, and consequently the patients suffer no further inconvenience.

The most important points in arteriograms taken for the purpose of localising brain tumours are: (1) The bends of the internal carotid in the cranial cavity. Anatomy treatises describe an anterior bend which

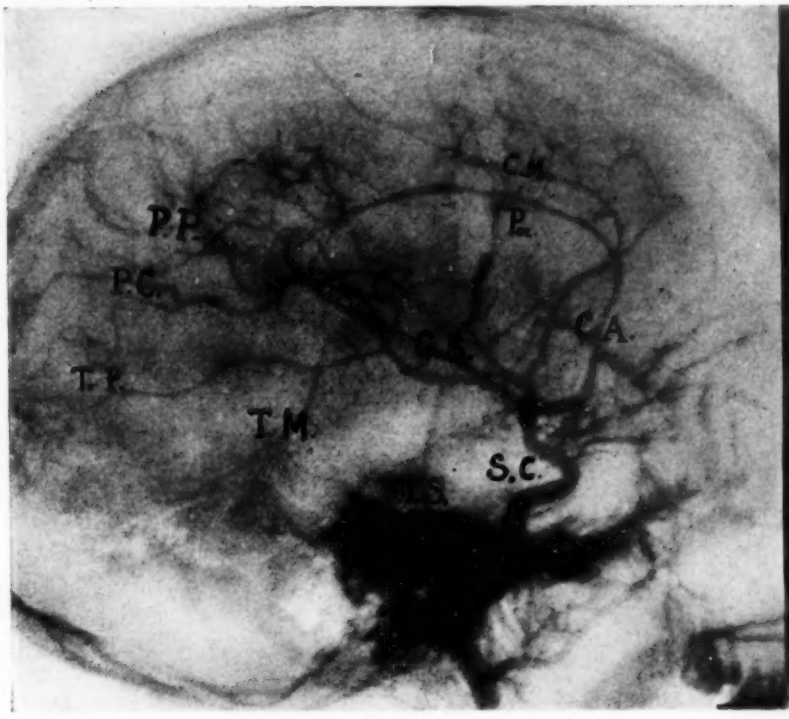

FIG. 1.—Normal arteriogram showing bend of internal carotid artery known as the carotid syphon.

FIG. 2.—Showing band of internal carotid artery forming double syphon (69 per cent. of cases).

FIG. 3.—Tumour of temporal lobe showing abnormal circulation in the tumour; the Sylvian group pushed up, and the carotid syphon deformed.

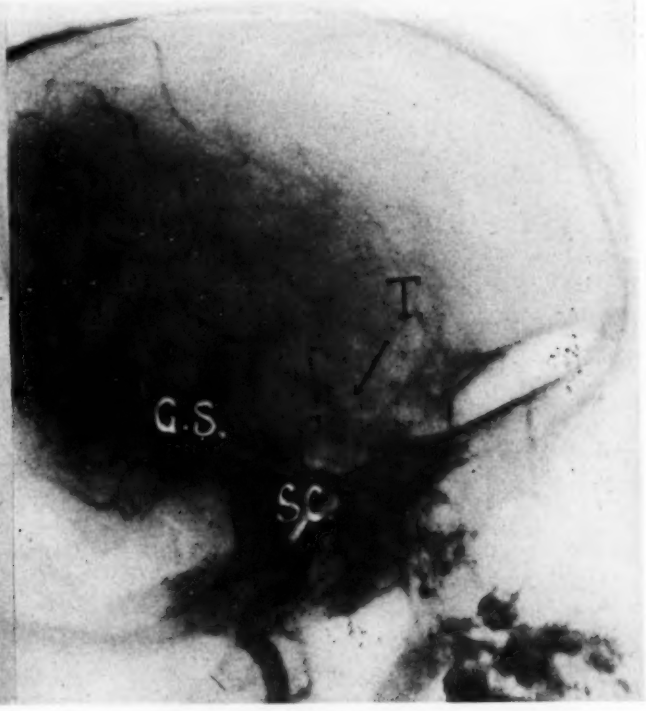

FIG. 4.—Frontal tumour. Carotid syphon and the whole of the Sylvian group pushed down by the tumour.

S.C. = carotid syphon. G.S. = Sylvian group. C.A. = anterior cerebral artery. C.M. = cingulate gyrus artery. Per. = pericallosal artery. P.P. = posterior parietal artery. P.C. = angular gyrus artery. T.P. = posterior temporal artery. T.M. = medial temporal artery. T.S. = superficial temporal artery. T. = tumour.

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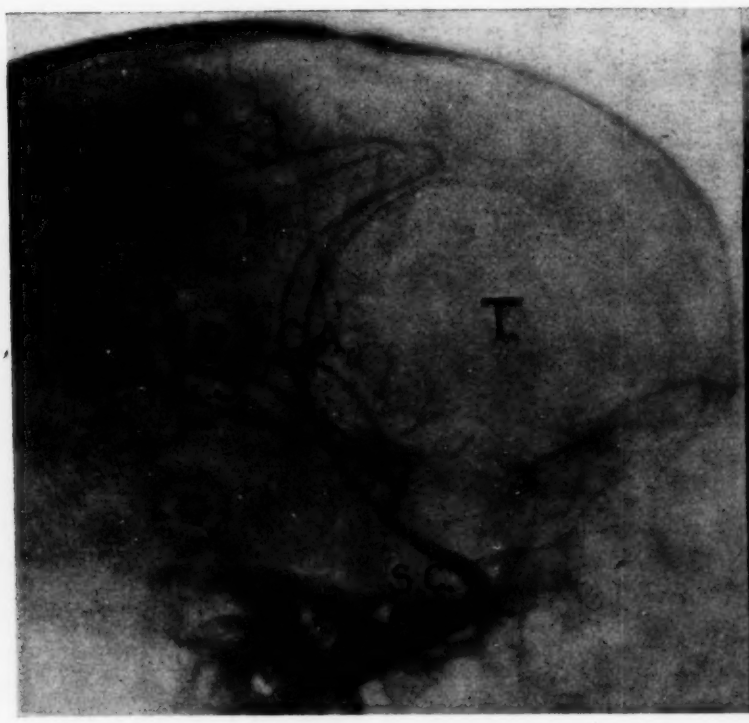


FIG. 5.—Displacement of anterior cerebral artery and pericallosal artery by frontal tumour.

FIG. 6.—Posterior cerebral artery (G.P.) branching from the internal carotid artery (25 per cent. of cases).

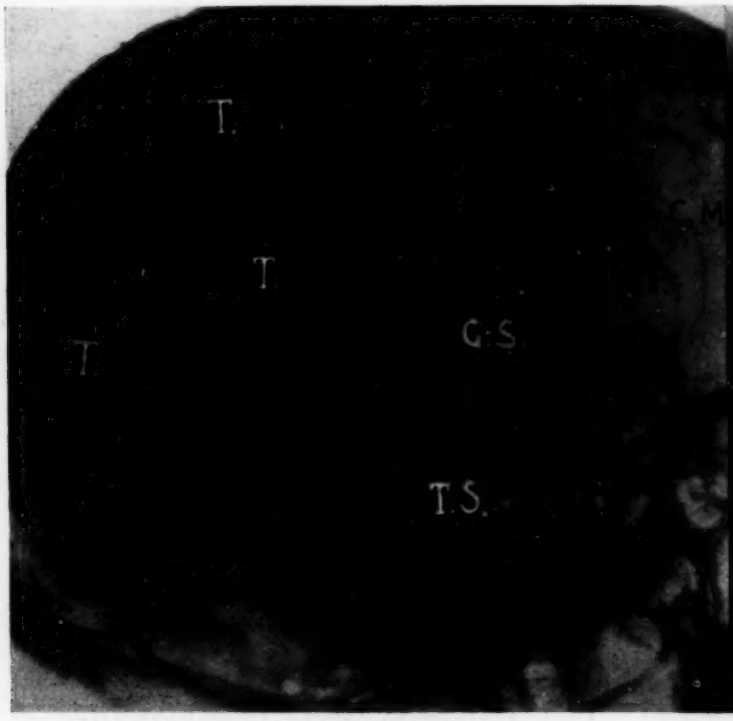


FIG. 7.—Abnormal circulation in a tumour.

FIG. 8.—Aneurysm of internal carotid.

T.S. = superficial temporal artery. T. = tumour. A. = aneurysm. P. = pericallosal artery. C.A. = anterior cerebral artery. G.S. = Sylvian group. S.C. = carotid syphon. C.M. = cingulate gyrus artery.

traverses the cavernous sinus and another which lifts the artery. The whole is really more complicated. After this second bend the artery curves forward and immediately backwards again (Fig. 1). We call this complex the *carotid syphon*. In 70 per cent. of cases the internal carotid shows another curvature towards the frontal region, giving the impression of a double syphon (Fig. 2).

Tumours of the temporal lobe are apt to deform the carotid syphon (Fig. 3). Frontal tumours may give it the shape of a half circle (Fig. 4).

(2) The middle cerebral artery is a short vessel which gives origin to the following long arteries: the posterior temporal, the artery of the angular gyrus, and the posterior parietal. These are the longest arteries in the brain and are, so to speak, the arterial axis of the brain. We give to this arterial section the name of *Sylvian group*. It is raised in cases of temporal tumours (Fig. 3), and is on the contrary depressed in cases of frontal tumours (Fig. 4) and parietal tumours.

FIG. 9.—Phlebogram showing straight sinus and inferior longitudinal sinus. V.B. = basilar vein. V.G. = vein of Galen. A.G. = ampulla of Galen. S.L.I. = inferior longitudinal sinus. S.L.S. = superior longitudinal sinus. S.D. = straight sinus. P.H. = Torcular Herophili. V.L. = Vein of Labbé.

(3) The anterior cerebral artery and its branch, the pericallosal artery (Fig. 1), may be dislodged by a tumour (Fig. 5).

(4) The posterior cerebral artery branches from the internal carotid in 25 per cent. of cases (Fig. 6). It is necessary to be aware of this anomaly in order to interpret the arteriograms properly.

In some cases the angiograms show abnormal circulation in the tumours, pointing out the situation of these and the origin of the arteries supplying them, a fact which may be very useful to the surgeon.

Fig. 7 shows an example of such abnormal circulation. The type of blood-supply depicted in the arteriograms may be an indication of the nature of a tumour—for example, a meningioma or an astrocytoma. Cysts show no evidence of circulation.

Aneurysms are easily diagnosed by angiograms. Fig. 8 shows an aneurysm of the internal carotid at the base of the brain.

Phlebograms of the terminal phase of circulation show the position of the straight sinus as well as of the inferior longitudinal sinus, which ought to be considered as one and the same. Both these sinuses are continued in a regular curve (Fig. 9). The vein of Galen and the basilar vein are also visible. The ampulla of Galen, in general very clear, is a tributary of the straight sinus.

The venous circulation of the brain gives in certain instances some diagnostic indications.

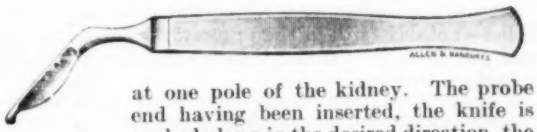
The speed of circulation is very different in the brain as compared with other parts of the head (meninges, face, extracranial tissue). We have ascertained this fact by studying the arteriograms and phlebograms of diverse cases, but confirmation was obtained by a series of angiograms, taken from second to second, after the injection of thorotrast in the common carotid and the external and internal carotids. The chief cause of this difference of circulation-rate between the brain and the other tissue of the head is the capillary barrier. The blood flows very rapidly in the capillaries of the brain, and is kept during some seconds, even some minutes, in the capillaries derived from the external carotid. If we obtain an angiogram of the head six seconds after the injection into the common carotid or into the external carotid, it shows the shadow of the opaque liquid throughout the head. This shadow is identical, whether obtained by means of the thorotrast or by a 25 per cent. solution of sodium iodide.

We have obtained more than 300 angiograms with thorotrast, and lately on both sides in the same session, without inconvenience to the patients, who are able to leave hospital and return home immediately.

NEW INVENTIONS

A RENAL CAPSULOTOMY KNIFE

THE knife shown in the illustration has been designed for incision of the renal capsule prior to decortication in the operation of nephropexy. The modus operandi is simple and effective. A tiny incision, large enough to introduce the probe end of the knife, is made



at one pole of the kidney. The probe end having been inserted, the knife is pushed along in the desired direction, the cutting edge dividing the capsule as it is raised from the kidney substance. The incision in the capsule is rapidly performed and there is no injury to the organ itself. The instrument has been made by Messrs. Allen and Hanburys, Ltd., Wigmore-street, London, W.1.

H. MORTON ANDERSON, F.R.C.S. Edin.
Coventry.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF THE HISTORY OF MEDICINE

AT a meeting of this section held on Nov. 1st, Sir STCLAIR THOMSON, presiding, introduced Prof. BURGER, of Amsterdam, who opened a discussion on

The Doctor and the Quack

The quack, he said, can afford to be an optimist. Doubts do not burden him. If his treatment fails the fault must lie in the bungling of his predecessors, the doctors. Deep in the mind of man lies the belief that the medical art is a divine gift. Nature, Prof. Burger pointed out, makes no distinction between the quack and the qualified practitioner, but does what she can for the patients of both; the quack never fails to put a feather into his own cap when his ally has helped him. It is true that some physicians inspire their patients with confidence from the moment they enter a room. The optimism of such a man is transmuted in the heart of his patient into a powerful faith. Not only may functional disturbances disappear under his suggestion, but real organic maladies may undergo an influence for good which is not to be underrated. The quack with a stimulating personality can achieve the same results. Prof. Burger told how a countryman in Holland had performed cures for years, many educated people believing him to have a divine power of healing, though his actual percentage of proven successes was small. Prof. Burger quoted the case of a wizard in Bohemia, with a long white beard, who treated hundreds daily. His treatment room was fitted with mysterious red lamps, stuffed snakes, and skeletons, and blind men and cripples were driven in herds past electrical apparatus, each sufferer being exposed for a second or two to X rays, helium lamps, and radium. The fame of the cures from this ritual was widespread, and the white-bearded Lucifero drew five or six thousand marks a day. In Germany, again, three years ago, the far-famed Zeileis brought a lawsuit for dishonest competition against a professor of medicine: which was a good thing, Prof. Burger remarked, as it gave the professor a chance of throwing some light on the facts. Among other evidence he was able to show that Zeileis had examined a number of healthy people and had credited them with various diseases, and that two women whom he had treated for mysterious swellings had not improved until nature came to their rescue and their pregnancies ended at term. The medical practitioner, said Prof. Burger, with all his faults, differs from the quack in being honestly ambitious for the welfare of his patient.

Dr. M. B. RAY mentioned a friend who promised recovery in a hopeless case and was subsequently adopted as family physician by the relatives because he was the only doctor who had given them any hope.

Mrs. SINGER spoke of the long life of non-scientific belief—notably faith in the properties of mandragora and the idea that a ring blessed by the sovereign would cure cramp.

Dr. C. O. HAWTHORNE suggested an appropriate attitude for the medical profession towards quackery. No attempt, he thought, should be made to suppress unqualified practitioners by law. It was better that people should be free to act foolishly than that they should be compelled and driven into paths of wisdom. But the profession ought to oppose any action which made it difficult for the public to distinguish between those who had had a medical training and those who had not.

Sir STCLAIR THOMSON pointed out that superstition is ineradicable in the soul of humanity. There is no intelligence test, he said, that would exclude the possibility of a man having recourse to quacks. He quoted the recently printed view of Sir Norman Angell, that man is a partially reasonable animal, and, if reasoned with long enough, will in the end give heed. But we must recognise this tendency as part of the outfit of human nature.

Dr. E. STOLKIND said that there were quacks in every country, and they all did well because they told the patient what he liked to hear.

Dr. LEONARD FINDLAY feared that education did not help. He felt that the more educated the public became the more gullible it was, while the advance of science had been so rapid in recent years that people could hardly be blamed for thinking nothing impossible.

Dr. ALEXANDER CAWADIAS thought the medical profession to be partly to blame if quacks flourish. The discoveries of Mesmer passed through a period of quackery before being employed therapeutically by Charcot and, later, Freud. Quacks, he pointed out, had played a part in developing hydrotherapy, the employment of sunlight in healing, and electrical treatment, and this was due to the narrow-mindedness of the medical profession about adopting new forms of treatment. And quackery flourished because medical men are too apt themselves to forget that there is an irrational element in medicine.

Sir THOMAS BARLOW and Mr. WARREN LOW congratulated Prof. Burger on his address, the discussion on which did little to answer the question put at the outset: "Why does the multitude crowd round the eloquent quack, though they would not trust a broken clock to anyone but a skilled watchmaker?" Perhaps the answer to the riddle was furnished in the lines quoted by Dr. E. W. GOODALL:

> "Doubtless the pleasure is as great
> Of being cheated as to cheat."

SECTION OF OTOLOGY

AT a meeting of this section held on Nov. 3rd, under the presidency of Mr. W. J. HARRISON, a discussion on

Vertigo

was opened by Dr. W. RUSSELL BRAIN. The term vertigo, he said, implied a sensory disturbance characterised by a hallucination of rotation, either of the patient or his surroundings or both. A definition based merely on derivation would however be much too narrow for clinical practice. It was more amply defined as the sensation of a disordered orientation of the body in space. This orientation of the body depended upon the integration by the nervous system of afferent impulses derived from a number of receptors, especially the retinæ, ciliary and extra-ocular muscles, semicircular canals, otolith organs, the joints and muscles of the cervical spine, and the proprioceptors of the lower limbs. These incoming impulses were coördinated by means of certain centres and tracts, the most important probably being the vestibular nuclei, the cerebellum, and the posterior longitudinal bundle. But there was evidence that the cerebral hemispheres, in particular the parietal lobes, played a part in the regulation of the position of the body in space. Vertigo may result from loss or disorder of the afferent impulses from any of the receptors mentioned, or from disturbance of their

coördinating mechanisms. In considering the pathogenesis of Ménière's syndrome in the middle-aged and elderly, a useful parallel might be drawn between the labyrinth and the eye, in which pathological changes of vascular origin were visible.

Aural vertigo was usually associated with a diminished excitability of the semicircular canals, and with a disturbance of the cochlear function, especially with deafness and tinnitus. Nystagmus was also an associated symptom. In severe cases it led to pallor, sweating, and disturbances in the blood pressure and the pulse-rate, also to nausea and vomiting; loss of consciousness was not usually an accompaniment. Diplopia might be associated with aural vertigo owing to the influence of the labyrinth on the posture of the eyes. Exceptional cases occurred, however, to modify these general statements. A patient might have recurrent attacks of apparently typical aural vertigo, with instability between the attacks, and yet show no impairment of excitability of the labyrinth or disturbance of cochlear function. And in rare cases consciousness might be lost. Aural vertigo might be associated with lesions of the eighth nerve: an acoustic neuroma, involvement of the nerve in a localised arachnoiditis, or in a syphilitic meningitis. When the cause was a tumour in addition to impaired cochlear and vestibular function an early symptom was diminution of the corneal reflex on the affected side; later there was headache and papilloedema. Lesions in pons and medulla might cause vertigo by interfering with the vestibular nuclei and their connexions. An example of this was thrombosis of the posterior inferior cerebellar artery.

In disseminated sclerosis vertigo was often an early symptom. But other symptoms, such as pallor of discs or alteration of reflexes, led to a correct diagnosis. Hyperpiesia might be responsible for dizziness, but was not usually associated with a sense of rotation; there was a feeling of instability liable to come on when the person stooped, and probably due to disturbed circulation through the labyrinth. Vertigo often followed head injury; it was one of the triad of symptoms accompanying cerebral contusion, and even when it was a sequel of a slight head injury it might last some time in the form of a feeling of instability following sudden turning of the head or stooping.

Vertigo might occur as an aura of an epileptic attack, especially in petit mal, where the differentiating features from aural vertigo were the suddenness of the onset, the impairment of consciousness, the brevity of the attack, and rapidity of recovery. Vertigo also occurred in migraine, both in association with the headache and vomiting and, less often, as a substitute for a typical attack. It was a common symptom of anxiety neurosis, being then usually associated with feelings of intense anxiety and with symptoms of overaction of the sympathetic nervous system. Dr. Brain considered that luminal was the most useful drug in the treatment of aural vertigo, and discussed the therapeutic value of division of the eighth nerve.

Mr. ALEXANDER R. TWEEDIE dealt with labyrinth tests and their aid to diagnosis. He was unable to place much reliance on rotation tests; of more use were the cold caloric and the galvanic tests in investigating labyrinthine function. The habit of describing a "nystagmus to the right or left" was unfortunate, as nystagmus was a secondary manifestation. The primary factor was an uncontrollable deviation, the result of a stimulus to some part of the vestibular apparatus. The central influence could be shown to be twofold: first a subconscious reflex situated in the midbrain, then a true volitional effort at control. Vestibular nystagmus was a movement resulting from an automatic reflex action designed to correct the deviation; slow turning of the eyes in one direction alternating with a quick and temporarily successful control. The reflex was primarily independent of will-power, as shown by de Kleyn and Versteegh. Nystagmus of the vestibular type could also be induced by lesions situated in the cerebrum and in the posterior cranial fossa. It was important to remember that in nystagmus there were three underlying factors: the initial deviation, the secondary involuntary reflex, and the true volitional effort.

In the clinical application of these facts great caution was needed. Cases fell into two groups: (1) vertigo without obvious aural lesion; (2) active inflammatory lesions of the middle ear associated with spontaneous nystagmus. In the first group he had been able to satisfy himself in most cases of the existence of an aural lesion, generally existing long before the vertigo was manifested. Different stimuli would produce nystagmus in different directions; the effect of the hot and cold caloric tests was opposite. Concerned in the mechanism, he thought, were the connexions between the two nuclei of Deiters, which might also afford a key to the compensation which occurred in the rotation test after complete destruction of the labyrinth on one side. The caloric and galvanic tests were particularly applicable to the vestibular function in non-inflammatory states.

Sir JAMES DUNDAS-GRANT said that some patients who had vertigo were epileptic; one such had an epileptic attack associated with cholesteatoma in the middle ear. After surgical treatment of the ear her epilepsy was almost imperceptible, and the slight attacks remaining were relieved by luminal. Following a kick on the mastoid by a horse, a young man had epileptic seizures; these ceased as soon as the mastoid operation had been performed. In the diagnosis of lesions of the eighth nerve he strongly advised the use of the galvanic test.

Mr. SYDNEY SCOTT spoke of vertigo due to some virus or other, and raised the question how a virus acted on the vestibular system. He had seen severe vertigo and nystagmus in heavy tobacco smokers, especially after indulgence in chain-smoking. One patient soon recovered after she gave up smoking.

Mr. T. RITCHIE RODGER commented on the rarity of pure cases of Ménière's syndrome. In one of his cases the attacks were associated with an unerupted wisdom tooth, and when that was put right the attacks ceased. Another case seemed to have been completely cured by a single lumbar puncture, though the cerebrospinal fluid was not under pressure.

Mr. J. F. O'MALLEY remarked on the difficulty of applying our knowledge of the causation of vertigo to a particular case; the parallelism between the ear and the eye was however helpful. He related a striking case of vertigo associated with excessive smoking.

Mr. THACKER-NEVILLE spoke of vertigo associated with faulty water metabolism, two cases having been very heavy tea-drinkers.

Mr. F. C. ORMEROD said he had not seen many cases of diplopia associated with vertigo. He agreed that rotatory tests were valuable for normal people, but were not of great assistance for pathological conditions. The most severe cases of vertigo he had seen were the result of cerebellar tumour. A very troublesome type was that associated with chronic suppurative disease of the middle ear; he had seen cases after apparently successful mastoid operations.

Mr. E. A. PETERS spoke of concussion due to explosions followed by vertigo; in nearly all the cases investigated a hæmorrhage was found alongside the

eighth nerve. Often there was no deafness. He thought nystagmus in a particular case should be based on the direction of the slow labyrinthine movement, not on the central quick movement.

Mr. C. W. GIBB related a case of mastoiditis with papilloedema, in which intracranial abscess was suspected but in spite of exploration was not found, spontaneous recovery occurring.

Mr. W. STIRK ADAMS thought that skew deviation was an important symptom which would repay investigation. He agreed that tests should be done oftener in acute cases, and related an instance of meningitis following mastoiditis, the autopsy revealing suppurative labyrinthitis.

SECTION OF PSYCHIATRY

A MEETING was held on Nov. 14th when Dr. EDWARD MAPOTHER gave his presidential address on

Tough or Tender: a Plea for Nominalism in Psychiatry

In British psychiatry of the past generation, he said, there has been a marked contrast between the wide spread of established knowledge concerning mental disorders and its application in treatment, and the limited extent to which the opportunities given by the new clinics for children and early cases have been utilised for research proper. One of the main reasons for this contrast is domination of psychiatry for a generation by idealism, which has replaced a former materialism, and the neglect of the proper attitude of science, which is nominalism. These terms may be defined as follows:—

Idealism is any system in which the object of external perception is held to consist of ideas. This exists in two forms: (*a*) subjective idealism, which regards all as ideas of the perceiving mind; (*b*) absolute idealism, which ascribes all not to our own ideas but to those of a universal mind.

Materialism is the doctrine that nothing exists except matter and its movements, and that the phenomena of consciousness are due wholly to material agencies.

Nominalism is the view which regards universals or abstract conceptions as mere names without any corresponding realities, and believes that immediate processes of perception are the only objects of knowledge.

Science is distinguished not by its subject matter but by its aim and method. The goal of science is the production of formulæ summarising the maximum number of past phenomena in the simplest, most concise, and most frugal manner possible, enabling us to foretell a sequence of future phenomena with the maximum economy of thought. It is crucial in science to distinguish clearly between observation and interpretation. Scientific observations must fulfil three requirements; they must be public, impersonal, and quantitative. Scientific interpretation must combine a maximum of simplicity, conciseness, comprehensiveness, and economy of hypothesis.

True modern science is completely phenomenalist. It is wholly concerned with events and with their sequence in space time. It is utterly agnostic as to what endures between those events. It recognises clearly as conceptual fictions anything which it may postulate as so enduring. Thus it is equally opposed to materialism and idealism and equally agnostic concerning the reality of mind and of matter.

This standpoint is opposed to the tendency of most prevalent psychology to exalt the alleged advance made by reference of phenomena to such conceptual fictions as instincts, complexes, and the unconscious mind.

Jung has emphasised the correlation between, on he one hand, nominalism, predominant extraversion, and what James called tough-mindedness, and, on the other hand, between idealism, predominant introversion, and tender-mindedness.

MODERN INFLUENCES IN ENGLISH PSYCHIATRY

Three writers who have largely influenced English psychiatry during the past generation, viz., William McDougall, Sigmund Freud, and Bernard Hart, have promoted the idealist outlook in the study of both normal and morbid mental processes. They have directed attention towards subjective events, i.e., changes in consciousness and away from objective occurrences, i.e., behaviour. They have tended to over-estimate scientific value of such general concepts as instincts and the unconscious mind. McDougall and Hart confine themselves almost to classification and conceptual formulations, while Freud has added to psychology a mass of novel observation. The scientific validity of this is marred by privacy, by bias, and by lack of all effort to make it quantitative. Hart has acclaimed as an epoch-making advance the introduction by Freud of the concept of the unconscious mind on the ground that it makes possible a self-contained psychology. There are many reasons for doubting the value of thus isolating psychology, particularly by importing into it many concepts for ever incapable of correlation with physical equivalents. Further, while Hart suggests the purely conceptual nature of the "unconscious" of Freud and his followers, they insist on its phenomenal nature and definite composition.

All the three psychologists named have a metaphysical background of animism. In the case of McDougall this takes the form of interactionism, in the case of Freud psychophysical parallelism. Recently Hart has tended to identify himself with the subjective idealism said by Jeans and Eddington to be the philosophy almost universal among physicists. Einstein, Planck, and Rutherford have utterly repudiated this metaphysic and the indeterminism which is a feature of it. Jeans and Eddington freely accept that the subjective idealism which they proclaim involves the introduction into science of theological conceptions. These and the indeterminacy which they necessarily imply abolish the possibility of those forecasts which it is the purpose of science to provide. A psychology and a physic alike which aim at being scientific must be causalistic not finalistic.

The worst effect of idealism in psychology has been its influence in promoting speculation as a substitute for controlled observation and experiment. The alleged successes of psychotherapy do not conform to the standard of scientific evidence in such a way as to make them valid proof of the theories upon which the psychotherapy is alleged to rest.

It is perfectly possible to frame a scientific psychology which would regard causalistic description of the processes of consciousness and behaviourism and the attempt to correlate these as its triple objective. It should be an aim to frame an explanation of the objective facts of behaviour both normal and abnormal in formulæ constructed as an upward continuance of those principles which account for responses mediated by lower levels of the nervous system. The starting-point of such formulæ can be found in the work of Hughlings Jackson, of Pavlov, and others. Attention to principles of neurology would lessen the vogue in psychiatry of the fallacies of the single cause, the solitary syndrome, and the specific cure.

INSTITUTES OF PSYCHIATRY

The best practical measure to ensure real advance in psychiatry by controlled observation and experiment would be the establishment of institutes of

psychiatry. Each such institute should have abundant access to cases illustrating every form, degree, and stage of mental disorder. Each should be staffed by at least half a dozen experts in different branches of science relevant to psychiatry. These experts will probably not be found in the ranks of those already experienced in psychiatry though the head of the institute should have such general experience. They should be given a year or two of intensive training in the subject so as to give them an appreciation of its immediate problems and a live interest in these. They should devote their whole time to research and the training of others for research, and should be protected from all other duties such as elementary teaching. The conditions of this appointment, including salary, tenure, and pension, should be such as will attract men of first-class intellect. Posts would be comparable to those recently established by the Rockefeller Foundation and the Medical Research Council, and presently to be established by the Beit Trust. There is legal provision in the Mental Treatment Act for such expenditure, and £50,000 a year spent on research in this way might reasonably be expected materially to reduce the £10,000,000 now spent on maintenance of the mentally defective and disordered.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

At a meeting of this society held in Manchester on Oct. 27th, with Mr. LEYLAND ROBINSON (Liverpool), the president, in the chair, a paper on the

Ætiology of Fœtal Malformations

was read by Mr. P. W. MALPAS (Liverpool). It was based, he said, upon a series of 294 fœtal malformations observed in 13,964 deliveries. The object of his inquiry had been to obtain reliable data of the incidence of malformations in general, and also to attempt to decide whether the malformations were of genetic or environmental origin. The total incidence of malformations in the series was 2·11 per cent. With some of them—notably anencephalus, hydrocephalus, hare-lip and cleft palate, mongolism, and congenital heart disease—the incidence showed a steady increase with the age of the mother. On the other hand, such malformations as spina bifida, talipes, and hypospadias showed no variation of frequency with the mother's age, and the incidence in the various age-groups was such as might be expected on the basis of random selection. The incidence of anencephalus, hydrocephalus, hare-lip and cleft palate, mongolism, and heart disease was found to increase with increasing parity, whereas club-foot, hypospadias, and spina bifida proved to have no such relationship to parity—with the possible exception of hypospadias, which showed an incidence in primiparæ (75 per cent.) too high to be explained on the basis of random genetic selection. Details of the ages of the fathers were obtained in some cases but in none was there noted a marked discrepancy between the respective ages of the two parents. Details of the presence or absence of consanguinity between the parents were obtained in 104 cases, and in none of them was it present. In the whole series there was only one instance of a malformation with a known hereditary bias—a case of web-toes, in which both mother and maternal grandfather had a similar malformation. There were 11 instances of previous malformations occurring in the children born to the parents of the malformed fœtus, and the incidence of a previous malformation was 4 per cent.—a higher figure than the normal 2 per cent. incidence of malformations. The recurrent factor was higher in the case of spina bifida, anencephalus, and hydrocephalus than with other malformations. The frequency with which a given malformation was followed later by another type of malformation appeared to show from another standpoint that most of the malformations dealt with could not be due to the action of specific groups of genetic factors, and reinforced the view that they are mostly attributable to the interplay of environmental factors.

Of the malformed infants 175 were males and 185 females. Anencephalus showed the high proportion of 69 females to 21 males; and iniencephalus was the only other malformation in which an excess of females occurred. Syphilis appeared to bear some relationship to the production of malformations, particularly of hydrocephalus. Among the mothers there was very definite evidence of poor physique and in many there was an unduly high proportion of feeble-mindedness or a low standard of living. There appeared to be a slight relationship between sterility and the subsequent chance of a malformed fœtus.

Mr. Malpas concluded that while some malformations were of genetic origin, the greater number were either caused by or conditioned by maternal environmental factors, and chief among these were age and parity of the mothers.

Gynæcological Cases

A number of cases were described, many of them being illustrated by specimens removed at operation.

ADVANCED EXTRA-UTERINE PREGNANCY

Dr. J. W. BRIDE (Manchester) described a case of extra-uterine pregnancy in a primipara aged 29, who attended the antenatal clinic at St. Mary's Hospital for the first time at the seventh month. In the early months of pregnancy she had had severe attacks of pain in the left iliac fossa, with a slight show at the third month. She was admitted to hospital at the eighth month because of slight continuous hæmorrhage, and the diagnosis of a dead fœtus and possible placenta prævia was made. Induction was attempted both medicinally and by hydrostatic bag and later the cavity of the uterus was explored and found to be empty. Radiography then revealed an extra-uterine pregnancy. Laparotomy was performed and a macerated fœtus removed. It was possible to remove the placental cotyledons but Dr. Bride thought it advisable to leave the bulk of the chorion behind, and the sac was marsupialised and packed with gauze and a large tube drain. Recovery was uneventful.

AN OVARIAN CYST COMPLICATING LABOUR

Prof. DANIEL DOUGAL (Manchester) reported three cases, including one of ruptured pseudo-myxomatous cyst complicating pregnancy and labour. The patient was first seen at the thirty-ninth week and gave a history of rapid increase in the size of the abdomen during the previous few weeks, associated with severe pressure symptoms. On examination Prof. Dougal found the abdomen enormously distended and with a marked fluid thrill. The fœtus could be felt lying longitudinally in the right lower part of the abdomen. A diagnosis of acute hydramnios was made and medicinal induction of labour decided upon. Labour began shortly afterwards and on rupture of the membranes only a small quantity of liquor escaped. The patient remained in slow labour for two days, but when the cervix was fully dilated the presenting breech was still high. The diagnosis was then modified to hydramnios in the upper sac of a twin pregnancy. Paracentesis was decided upon, but on puncturing the abdomen no amniotic fluid escaped but only a little blood-stained colloid material. This revealed the presence of an ovarian cyst, and when laparotomy was performed a ruptured pseudo-myxomatous cyst was discovered arising from the left ovary. A living child was delivered by Cæsarean section and the uterus and tumour removed by subtotal hysterectomy. The patient eventually made a good recovery.

LOSS OF ASCITIC FLUID THROUGH THE VAGINA

Mr. W. W. KING (Sheffield) described a case in which ascitic fluid was evacuated through the vagina, simulating urinary incontinence. The patient, aged 57, had complained of incontinence of urine for more than a year, which had been particularly troublesome at night. The fluid tended to come away on exertion especially on bending, and at times came away in floods on stooping. Previous micturition did not prevent the passage of what she thought to be urine. On examination an abdominal tumour, the size of a four months' pregnancy, was discovered; it was hard and mobile and which was thought to be a uterine myoma. Some free fluid could be detected in the abdominal cavity. Pelvic examination revealed a small cystocele and the uterus normal in size and attached to the abdominal tumour by a pedicle. No cause for the incontinence of urine was found. On examination under anæsthesia a little fluid was found in the vagina flowing out through the cervix and about ½ oz. was collected for examination. Laparotomy revealed a fibroma of the right ovary the size of a four months' pregnancy and there was a moderate amount of clear ascitic fluid in the peritoneal cavity. Total hysterectomy with removal of both ovaries was performed. Examination of the fluid collected from the vagina showed it to be ascitic fluid, and this apparently had been escaping through the Fallopian tubes and uterus. The patient made a good recovery and was completely cured.

Dr. J. W. BURNS (Liverpool) exhibited a specimen for diagnosis.

LIVERPOOL MEDICAL INSTITUTION

AT a meeting of this institution on Nov. 2nd, with Dr. H. R. HURTER, the president, in the chair, a paper on

Chronic Ulceration of the Colon

was read by Dr. EDMUND SPRIGGS. He gave a detailed account of his clinical experience of the disease with special reference to the treatment and prognosis of 42 patients treated in 17 years. Of these 35 were alive to date, most of them living normal lives. Thirteen had an amœbic infection. The mortality was far below that in published statistics from general hospitals, and the prognosis for normal moderate activity as well as for life much better. The average period of treatment was three months. The fact that most of the cases responded well to treatment proved that their betterment was not due to accidental remissions. Dr. Spriggs emphasised the importance of examination with the microscope, sigmoidoscope, and X rays. In treatment vaccines and sera had seldom proved more useful than the older methods of rest and diet, medicines, and douching. The main factor was daily close nursing and medical care.

In the discussion which followed, Prof. JOHN HAY referred to the type of case admitted into the general hospitals, and said that he classed ulcerative colitis among the dangerous diseases; in the more severe forms, indeed, it was deadly. In his experience transfusion was life-saving, and it should never be delayed if, on examination, the degree of anæmia was found to have reached a dangerously low level. Persistent vomiting, although not a common feature, sometimes gave rise to serious difficulty, since success in treatment depended upon an adequate and proper diet. There was a real danger of vitamin starvation if by any chance the need for adequate vitamins in the diet was overlooked. Achalasia of the upper sphincter of the œsophagus was an interesting symptom seen occasionally. In the more acute stages of the illness, with pyrexia and rapid heart-rate, anything in the nature of lavage of the bowel was detrimental, and reliance must then be placed upon opium to diminish the discomfort and frequency of the motions. In the United States Prof. Hay had found a widespread tendency to discredit Bargen's theory and an increasing belief in the dysenteric origin of chronic ulcerative colitis. Paulson, of Washington, held that continued hæmorrhage tended to kill all organisms except the cocci; these were found in the stools not because they were causative but because they alone survived. In Mount Sinai hospital in 40 per cent. of the cases a bacteriophage specific for the dysenteric organism had been demonstrated. The trend of opinion seemed to be against operative interference except in certain well-defined conditions.

Dr. ROBERT COOPE said that the search for some specific bacteriological cause of ulcerative colitis tended to direct attention away from the fact that the large intestine itself was a delicate organ, easily damaged and, when damaged, not restored to health without thoughtful and long-continued care. Now and again, some special form of treatment might give results that seemed dramatic enough; but always it was important to visualise the condition of the bowel itself, to be awake to the fact that already serious damage might be done even while symptoms and the appearances of the stools were not very alarming, and to ensure that, during treatment, the bowel was given the conditions under which it might have the best chance of gaining and maintaining recovery. Careful insight into the history of most of the cases that reached an advanced stage would reveal symptoms that should have demanded full investigation years before—attacks of liquid diarrhœa, with mucus and with stools that under the microscope could be seen to contain pus; attacks which recurred, in spite of treatment, long before there was any obvious passing of blood, and which depended upon the early pathology of chronic ulcerative colitis. If every acute or subacute inflammation of the colon warned one of the possibility of future trouble, just as an appendix attack (not operated upon) kept one on the *qui vive*, there would be fewer advanced and desperate cases of ulcerative colitis. Moreover, once an attack of colitis had occurred, the delicate large bowel needed to be guarded from irritation, and both diet and drugs were important to this end. Dr. Coope wished to emphasise particularly the disadvantage of allowing undigested and partially digested meat-fibre to reach the large bowel, there to putrefy. Examination of the stools and urine afforded a simple control of this. It was a practical point, in that the products of intestinal putrefaction could seriously irritate and damage the large bowel, and furthermore that during convalescence it might be wise to keep a patient off meat diet for many months.

Dr. R. W. BROOKFIELD alluded to two unusual complications observed by him in cases of ulcerative colitis. In one patient extensive sloughing of the abdominal wall had followed the application of Scott's dressing for a few hours and led to the patient's death. In another, bilateral suppurative parotitis due to the *Staphylococcus aureus* had occurred. The patient recovered. He also mentioned the difficulty sometimes experienced in diagnosing ulcerative colitis from intestinal tuberculosis. In one case where radiography of chest and abdomen gave negative results, tubercle bacilli had been repeatedly searched for in the fæces and were only found after digestion of the latter with antiformin. In a small series of cases he had studied no instance of complete achlorhydria had been encountered. This was in marked contrast to the large group of diarrhœas, typified by the recurrent attacks of diarrhœa met with in pernicious anæmia and subacute combined sclerosis, in which achlorhydria was an important ætiological factor.

REVIEWS AND NOTICES OF BOOKS

Mental Defect

By LIONEL S. PENROSE, M.A., M.D., Research Medical Officer, Royal Eastern Counties Institution, Colchester. London: Sidgwick and Jackson, Ltd. 1933. Pp. 183. 8s. 6d.

THIS book, the first of a series dealing with problems of social biology, edited by Prof. Lancelot Hogben, reflects the approach of the scientific research student to the subject of mental defect. Methods of physical, physiological, psychological, and genetical investigation are indicated, with the results so far obtained, but it is made clear that real research into mental defect is yet in its beginnings. The chapter on analytical methods assumes a knowledge of genetics which is not common among medical men; some introductory matter would have been helpful here. Dr. Penrose's concise style, in which every sentence embodies a separate fact, makes this chapter hard to read except for the expert. It is essential, however, to the purpose of the book and therefore must be mastered. Dr. Penrose is not content to accept without question traditional views on pathology, ætiology, classification, and treatment, and indeed the main interest of his book consists in its fresh ideas on these matters. The author is sceptical of the close relationship between cerebral cortical structure and intelligence, often too dogmatically asserted, and he questions whether histological examinations of brains of defectives with intelligence quotients (I.Q.) over 50 would reveal similar pathological changes to those claimed to be discovered in low-grade cases.

The part played by environment in causation of mental defect has, in Dr. Penrose's opinion, been unduly neglected: primary amentia has been too readily assumed to be hereditary. Out of 513 cases studied, as many as 329 could not be definitely classed as either primary or secondary amentia. He concludes that 91 per cent. of cases are due "in some measure" to heredity, and 71 per cent. to environment. He would therefore set aside this traditional classification; but he is prepared to accept Dr. E. O. Lewis's division of cases into the pathological and the subcultural, with the reservations that there are many mixed cases, and that subcultural cases must not be regarded necessarily as cases of simple primary amentia, and therefore hereditary. "Strictly speaking," he says, "an environmental element enters into the description of every case actually certified, since the necessity for certification depends upon social conditions." Several chapters of exceptional merit are devoted to pathological types.

At a time when the question of sterilisation is prominent, the provocative chapter on treatment will arouse special interest. It is characteristic of Dr. Penrose that in dealing with preventive treatment he begins with the environment—antenatal environment including the health of the mother from conception onwards, her nutrition, endocrine disorders, antisyphilitic measures, and so forth. He sees in the improvement of social conditions a chance of avoiding certification of behaviour cases of high grades. He shows more courage than most writers in suggesting the desirability of judicial destruction at an early age of children who are obviously seriously defective; his curious exaggeration of the difficulty of early detection of such cases is perhaps an unconscious defence mechanism against attack. He displays some impatience with pro-sterilisation die-hards. His main contention appears to be that sterilisation need only be considered in reference to defectives of I.Q. over 60, and that as these have usually to be placed in institutions because of behaviour difficulties sterilisation would be of no avail. "What would be the use," is his question, "of bringing in legislation to sterilise the particular persons who are already adequately catered for and segregated by the present law"? Surely the latter part of this sentence takes for granted an ideal state of affairs very far from being realised. His suggestion that sterilisation is regarded by some and even welcomed as a punitive measure scarcely applies to mental defect, and his illustration is hardly relevant. His further suggestion that "unconscious motives" lie behind the propaganda is one that might be used in the attempt to discredit many movements even less controversial. He is not entirely convincing in his handling of sterilisation.

The book as a whole is full of valuable material. It is not merely another addition to the already large number of books on the subject, for it has an atmosphere and an outlook all its own, and no one interested in mental defect can afford to ignore it.

Bone Growth in Health and Disease

By H. A. HARRIS, D.Sc. Lond., M.B., Professor of Clinical Anatomy, University College and University College Hospital. London: Humphrey Milford, Oxford University Press. 1933. Pp. 248. 34s.

THE issue in book form of the outcome of Prof. Harris's extensive radiological and histological researches has been expected for some time, and we congratulate him on the appearance of such an interesting and valuable compilation. His work was begun with the object of solving the problem of the origin of those transverse lines on the long bones which had usually been ascribed to healed rickets, but which Prof. Harris has certainly proved to be lines caused by temporary cessation of growth from any cause. He has also established by radiology the truth of John Hunter's and Duhamel's contentions as to mode of growth in length. It seems probable that in the future importance will be attached to these lines from various other points of view. Prof. Harris insists on the recognition of the three zones (proliferation, calcification, and osseous change) as biologically distinct; but he deals with the compound growth as a whole, and does not concern himself particularly with the method or reason for the presence of earthly salts until he nears the end of his monograph, when, inspired by Robert Robison's phosphatase and supported by the glycogen content of cartilage cells near centres of ossification, he lets himself go on a physico-chemical hypothesis. We gather that Prof. Harris considers osteoblasts to be produced as one result of rejuvenescence of senescent cartilage cells, but he does not, presumably, claim this origin for them all. The relevant illustration does not seem to us to show anything convincing, and in any case the osteoblasts of membrane bones must be considered. Without in any way subscribing to the views of Policard and Leriche, we would like to see some objective proof that osteoblasts do really perform the functions with which they are here credited. The sections dealing with diseases affecting bone growth should be of importance for the pathologist, and we found the account of the conditions in Paget's disease especially interesting. Prof. Harris tilts every now and then at the vitamin-enthusiasts;

we confess to sympathy with his insistence on the need of mixed diet of fresh food for children suffering from diseases causing retardation of growth. Many of his observations are of great anatomical interest, apart from histology, and will doubtless lead to further investigations.

The book should be studied by all whose work or inclination embraces this subject. The opinions expressed may arouse opposition or even hostility in those who, like the author, have formed definite views on osteogenesis, but this does not take away from its value or its interest.

The Camberwell Miracle

By J. D. BERESFORD. London: William Heinemann, Ltd. 1933. Pp. 327. 7*s.* 6*d.*

A CAPABLE novelist relates here the circumstances in which a lame girl appeared to owe her cure to the psychological ministrations of a medical man. The cure and the doctor were advertised, with no instigation from the miracle worker, in a way that led to the removal of the doctor from the medical register, and an action for libel between two newspapers. A curiously conducted trial leads to the establishment of the doctor's bona fides, so that his name is restored to the register. The author has tackled a difficult problem and will leave readers much where they were before in respect of its solution. The book is thoroughly well written and the thaumaturge's character and capabilities are sympathetically revealed. If the question posed is, as it is stated to be on the jacket: "Can all diseases and deformities be cured by mental healing, under favourable conditions?" then the reply furnished by the story is not in that general affirmative which the jacket would further suggest. But probably nothing so sweeping was intended by the author. We recommend "The Camberwell Miracle" to our readers, for it sets out fairly the difficulties inherent in psychological treatment, although a closer knowledge of medical practice and organisation would have removed certain of the incidental interest. The dice are loaded on the side of the miracle worker by making his chief opponent a bounder. A more receptive attitude towards the possibilities that underlie mental healing was displayed by some of the speakers who took part in the recent discussion at the Royal Society of Medicine on Prof. Burger's interesting address on quackery.

The Coming of Man: Was it Accident or Design?

By R. BROOM, M.D., F.R.S. London: Witherby and Co. 1933. Pp. 238. 10*s.* 6*d.*

Dr. Broom is an acknowledged authority on vertebrate palæontology who has won distinction by his studies of the reptilian and mammalian fossils of South Africa. He has therefore a first hand, direct, and intimate knowledge of the material on which he bases the general considerations of which he gives an account in this interesting volume. Like Osborn, similarly equipped by a lifelong study of the American material, he comes to the considered opinion that evolution cannot be explained along Darwinian lines, and that the whole picture gives an irrepressible conviction that evolution is purposive and has been directed by one or more external agencies roughly similar to what in religious language have been called God and Devil. Animals and plants are now so specialised that there are few, if any, undifferentiated foci left from which further evolution along physical lines can reasonably be expected; possibly, says Dr. Broom, the directing agencies are now more interested in producing higher types of personality, and what we call conscience may be our perception of their suggestions. Conclusions such as these, coming as they do from masters of their craft, cannot be lightly set aside. A hundred years ago some of the best minds in science were writing the Bridgewater Treatises, and after the long dominance of Victorian materialism we have perhaps come round again to see in nature the manifestation of the wisdom and goodness of God. Incidentally, those who are not much interested in Dr. Broom's philosophy will find a long account of the Taungs skull found by Prof. Dart in Bechuanaland; it is regarded as nearer a missing link than anything else that has been discovered.

Surgical Anatomy

Second edition. By GRANT MASSIE, M.B., M.S., F.R.C.S., Assistant Surgeon to Guy's Hospital. London: J. and A. Churchill. 1933. Pp. 458. 18*s.*

IN this second edition certain changes and additions, both in illustrations and text, have been introduced. New sections deal with injuries and infections of the hand. We would like to see more stress laid on the lumbrical muscles in association with deep infections in this region. Useful figures are given showing different kinds of right and wrong incisions. In the anatomical accounts of the knee we do not find ourselves in complete accord with the author's views about the lower attachment of the tibial collateral ligament, and we may point out that, although the relevant diagram showing the intercostal nerve course may agree with the modern teaching, the account of the intercostal arrangements in the text can hardly be said to do so. A new terminal section deals adequately with the autonomic nervous system and the anatomical bases of certain surgical proceedings connected therewith.

Letters and Diaries of A. F. R. Wollaston

Edited by MARY WOLLASTON. London: Cambridge University Press. 1933. Pp. 261. Four portraits. 12*s.* 6*d.*

Wollaston was a man with an inexhaustible passion for the country and wild places and the birds and insects and flowers which live in them. He took a medical qualification because he thought it would help him to get taken on expeditions, which it did, and it proved useful, too, in the war. After wandering up and down the world for 30 years he married and had a home for the first time. He left the Cotswolds when he was 53 to take up tutorial work at his beloved King's College, where a year later he was killed by a crazy undergraduate. In this very charming book his diaries and letters tell the tale of his adventures—Lapland, Egypt, Australia, Japan, Central Africa and the Ruwenzori Mountains, twice to New Guinea, Everest, and Colombia, and the gaps filled in with the wilder parts of Britain. It will be a delight to those who knew him and will make those who did not wish they had. Naturalists are generally nice people and Wollaston must have been one of the nicest, with the advantage that he had the knack of vivid expression. "Cor" at the top of p. 181 is an unexpected misprint.

THE LANCET

LONDON: SATURDAY, NOVEMBER 18, 1933

ECONOMY AND RESEARCH IN THE SCHOOL MEDICAL SERVICE

THE Ray Committee in its report last autumn remarked [1] that while no responsible man would challenge the need for continued research in preventive medicine, it was a question whether time and expense could not be saved by an extension of the principles of coördination into the field of local school medical research. This committee recommended that special researches, as distinct from compilations based on evidence obtained in the ordinary course of medical inspection and treatment, should not be initiated without prior reference to the medical department of the Board of Education. On this pronouncement a responsible writer comments in our own columns thus: "It is hard to conceive of any procedure more likely to strangle the spirit of research." Progress in the service, as Dr. O. M. HOLDEN said [2] a week or two ago in his presidential address to the school medical service group of the M.O.H.'s, is dependent on thought and research. The doctor who can discriminate between health and ill-health on the strength of the cursory scrutiny of a march past belongs to the race of supermen; and in his report [3] as chief medical officer of the Board of Education, Sir GEORGE NEWMAN says in a pregnant sentence—the research spirit is the key of clinical examination. Diagnosis and prognosis are not becoming simpler; they are becoming more detailed and exacting. The school medical officer is faced with new problems of diagnosis, treatment, prognosis, and prevention. He is not to be an automatom or a mechanic but an explorer finding new ways and means of helping the subnormal child and strengthening the normal. The service, in Dr. HOLDEN'S words, is a receiver of damaged goods—the extent of which can be seen in a table repeated year by year in the introduction of the chief medical officer's report. In the same introduction is a table showing the incidence of certain defects requiring treatment for each of the last five years. Last year every thousand inspections revealed 86 defects of vision, 51 enlarged tonsils and adenoids, 10 cases of malnutrition, 10 cases of skin disease, 10 deformities of various kinds, but the only item which has shown real decline in the period is tuberculosis, in which there is a significant drop. Orderly discharge of routine inspection and treatment must constitute the major preoccupation of the school doctor, but surely it is well to leave him a large degree of liberty to plan his work in accordance with the particular needs of the area. Out of these arose a large majority of the special investigations made last year (and set out in an appendix to the chief medical officer's report); they average about a hundred a year and are classified in the medical department of the Board under 37 headings, of which the principal, in order of frequency, are:—

rheumatism and heart disease, mentally defective children, eyes and defective vision, nutrition and provision of meals, nose and throat, physically defective children, goitre, school hygiene, teeth, ear disease and hearing, employment of children, infective and contagious diseases, nervousness, home, social and industrial conditions, height and weight, brain and spinal cord, skin affections, tuberculosis, speech defects, open-air schools, artificial sunlight.

Investigation, Sir GEORGE remarks, reacts favourably on the general level of the quality of the work in the service. The keen man who undertakes investigation work is likely in consequence to do better routine work, and the better the routine work, the more likely will problems for investigation arise in the course of such work. To such a worker investigation comes in his stride. It neither can nor should be avoided.

[1] See THE LANCET, 1932, ii., 1238.
[2] Public Health, November, 1933, p. 50.
[3] The Health of the School Child. Report for the year 1932. H.M. Stat. Office. Pp. 178. 2*s.* 6*d.*

VITAMIN A AND INFECTION

THERE has been a good deal of argument as to whether it is justifiable to call vitamin A "anti-infective," and (as we have lately insisted [1]) some of the discussion has gone beyond the probabilities. What then is the evidence? It is quite clear that in rats a well-defined partial deficiency of vitamin A conduces to a cornification of the mucous membrane which permits the entrance of infections in various parts of the body; and this does not happen with other vitamin deficiencies. So far the facts are scarcely in dispute. But when we seek the analogue for these infections in the human being, we reach a point where opinions conspicuously differ. It was hoped at first that puerperal sepsis and the commoner respiratory infections of infants and young children would prove to be the analogues, and that with a more abundant supply of vitamin A their incidence would be much reduced. So far as respiratory infection is concerned, however, this hope has not been realised. A number of large-scale trials have been made in which groups of children, generally in institutions, have been treated with cod-liver oil, carotene, halibut-liver oil, or some form of vitamin-A concentrate, and compared with similar groups untreated. But the results have been consistently disappointing, and the two most recently reported have only the same story to tell. In his Ingleby lecture at Birmingham last July, Prof. A. F. HESS described the observations made by himself and his colleagues [2] at the Hebrew Infant Asylum, New York, among children under 3. The treated and untreated groups each contained about 70 babies, carefully selected to be comparable in age, and the observation was made over the winter. The result was negative, the group treated with vitamin A being no less subject to infections than the control group, and a further test, carried out over the summer, when

[1] THE LANCET, August 19th, 1933, p. 426.
[2] Hess, A. F., Lewis, J. M., and Barenberg, L. H.: Jour. Amer. Med. Assoc., August 26th, 1933, p. 657.

infections were milder, yielded the same answer. HESS concludes that "there is no clinical basis for considering or designating vitamin A the anti-infective vitamin." The other investigation recently recorded was made by Dr. ROBERT SUTHERLAND,[3] in the winter of 1931–32, at the North School, Peterhead, which is frequented by very poor children. One group of 281 children received two Radiostoleum capsules daily, while another group of 294 got control capsules of arachis oil. SUTHERLAND'S study is very elaborate and includes observations of a great number of points in connexion with health by which the true comparability of the two groups was carefully established. But although the children receiving radiostoleum did show a slight superiority in growth, he sums up by saying: "No definite evidence of diminished susceptibility to infection or of increased resistance to established disease has been found in the radiostoleum group considered as a whole."

These two inquiries, with others equally disappointing, leave little doubt that the incidence of respiratory illness amongst the ordinary child population of Great Britain or the United States cannot be lowered by prophylactic treatment with vitamin A; for this class of disease vitamin A is certainly not an anti-infective vitamin. And on reflection one is able to see that the hope was likely to be vain, for a comparison was being made between two states which were not truly analogous. The rat, when it develops infections due to vitamin-A insufficiency, is already very definitely depleted of vitamin A, though not completely so, and its eyes can easily be seen to be abnormal. The Peterhead school-child, on the other hand, is not in such a condition; night blindness, one of the earliest signs of vitamin-A deficiency, is certainly not common. When, however, a child really is depleted of vitamin A, as in C. E. BLOCH'S famous series of cases, reported in 1921, it is intensely susceptible to infection, and readily succumbs to it. O. BLEGVAD (1924), for instance, mentions that in children suffering from keratomalacia, the cause of death is nearly always broncho-pneumonia; in a series of 60 cases of keratomalacia, 46 died from this cause, while enteritis, pyelitis, and nephrolithiasis also occurred. These are the infections in man which are truly analogous with those in the A-deficient rat, and it is in these circumstances that, both for man and rat, vitamin A is truly an anti-infective vitamin.

When we do find evidence that vitamin-A therapy has influenced the course of infection there is usually a probability that, through disease or some special cause, the body's reserves of vitamin A had been brought so low that the mucous membranes were damaged and thus made vulnerable. It may well be that women under the drain of pregnancy get near this level; and Prof. E. MELLANBY, in the Lloyd-Roberts lecture which we publish this week, points out that when a group of 275 pregnant women was treated with vitamin A before delivery their morbidity-rate was lower than that of controls—to a statistically significant degree. In South Africa, where native mine-workers are notoriously subject to pneumonia, administration of vitamin A after onset of the disease was not found of any value, but there was at least an indication that the mean vitamin-A reserves in the liver of those dying from pneumonia was lower than in controls dying from accident.[4] Indeed, F. W. FOX,[5] coördinating his own South African figures with those given by L. K. WOLFF and by T. MOORE in our columns, believes that "there is no longer any doubt that persons dying of pneumonia tend to have lower reserves of vitamin in their livers than those who have died from accidental causes." In this connexion, it may be mentioned that the London County Council's report on measles, reviewed in our issue of Oct. 28th, mentions (p. 91) a series of 300 cases of measles treated with a concentrate of vitamins A and D, in which the total deaths—almost all from pneumonia—numbered only 11, whereas in a control untreated group there were 26. In each of these three instances—puerperal sepsis, pneumonia in native mine-workers, and pneumonia complicating measles—there is a possibility that the vitamin-A reserves of the patient were so depleted, for one reason or another, that the soil was made ready for the seeds of disease to germinate. In this sense and for such cases vitamin A may be the anti-infective vitamin. With common colds and the milder respiratory diseases of infants and young children, however, there is no indication that lack of this accessory factor is an essential part of the preparation of the soil. It may be that here some other factor plays an important part—an insufficiency of iron for instance, as Prof. MELLANBY suggests. But it does now seem regrettably certain that vitamin A does little or nothing to prevent the everyday respiratory infections.

DOMESTIC WATER PIPES

FROM early times water has been distributed from the mains in pipes made of lead, one of the most poisonous of metals. Its great ductility and the ease with which joints can be soldered specially fit it for the tortuous system needed to carry a supply of water into various parts of a house. As large towns have, in the main, grown up on the banks of rivers whose water contains calcium bicarbonate from the limestone or chalk strata through which it has passed, no ill-effects have as a rule been observed. The state of affairs became very different when some of the northern towns, seeking a purer supply outside their own borders, began to draw on upland sources yielding very soft water. Dr. R. P. WILLIAMS has told the story in a lecture at King's College, published in our issue of Oct. 28th (p. 990). It is remarkable that distilled water or water containing so little mineral matter as closely to approach it in solid content—moorland water contains about four parts per 100,000—should have the power of dissolving lead so rapidly.

[3] Sutherland, R.: M.D. Thesis, Univ. of Aberdeen, 1933.

[4] Orenstein, A. J., and Fox, F. W.: S. African Med. Jour., 1932, vi., 685 and 689. [5] Fox, F. W.: THE LANCET, 1933, i., 953.

Distilled water in contact with sheet lead for an hour or less takes up sufficient of the metal as hydroxide to give a strong reaction with chromate; this is however soon precipitated as carbonate, which is only very sparingly soluble in water but much more soluble in the gastric juice. For solution to occur the water must contain dissolved oxygen or be exposed to the air, whence the carbonic acid which precipitates the lead when dissolved is also derived. Pure lead can be kept without tarnishing under oxygen-free water, but this condition cannot be ensured in waterworks practice. Fortunately, if the water contains appreciable amounts of carbonates, sulphates, or silicates the solution of lead soon ceases.

The explanation seems to us something like this:—

Lead like most other metals is appreciably, although very slightly, soluble in water; witness the oligodynamic action of silver and of copper on bacteria and green growths in water. In the presence of anything, like oxygen, which will form with the ions at the surface a compound more soluble than lead itself, the chemical action goes on until a saturated solution—in this case of lead hydroxide—is formed. If however the water contains ions which will form less soluble lead compounds, the lead ions which tend to leave the surface of the metal remain anchored to it and form a protective coating of carbonate, sulphate, and/or silicate. But this protective action occurs only when the proportion of ions forming these sparingly soluble lead compounds is sufficient to depress the solubility of the lead salts, in accordance with the law of mass action by which the mutual solubility of two ions is determined by their "solubility product." For instance, a completely saturated solution of (say) lead sulphate will, on the addition of an excess of either constituent, yield a precipitate; hence lead sulphate is less soluble in water containing calcium sulphate than it is in distilled water. When a water contains traces of free sulphuric acid, as some peaty waters may do which have been in contact with iron pyrites, lead sulphate is likely to be formed and to go into solution to saturation point, there being only a small excess of sulphate ions to depress the solubility of the lead.

The most certain way of decreasing the solvent action of water on lead is to neutralise any mineral or organic acids in it by passing it over limestone or chalk, which will dissolve in amounts sufficient to ensure the formation of a protective coating on the pipes. The addition of flint pebbles to provide a little silicate further decreases the possibility of a dangerous amount of lead getting into the water. The amounts dissolved are in any case of course very small, but one part of lead in two millions of water is dangerous—in fact, any detectable amount should be considered as too much, since lead is only very slowly eliminated from the body.

Prof. L. S. P. DAVIDSON, with his collaborators, has recently described in our columns[1] an outbreak of lead poisoning in the north-east of Scotland, which was investigated by him and a group of colleagues. The facts are disturbing. Supplies of water, presumably mostly from private sources, were conveyed to houses by long lengths of lead piping, and the lead content of the water first run off after the pipes had stood full for a time was sufficient to explain the many cases of lead poisoning among the inhabitants. Having regard to the almost general use of lead for water pipes it seems incumbent on public water authorities to render their supplies incapable of dissolving lead. If this cannot be done other materials must be used for the pipes. Prof. DAVIDSON suggests the replacement of lead pipes by iron. This might give rise to the need for frequent renewal and complaints of chalybeate tastes in the water. Galvanised pipes yield zinc to some waters, and although not very poisonous zinc salts have an unpleasant flavour. Lead pipes coated internally with tin are available. But tin is the most expensive of the base metals and although well-coated tin-lined pipes would be absolutely satisfactory—tinned vessels have long been used for many years for culinary purposes—if the coating is not continuous the danger is still present, for, if tin and lead are left in contact in a plumbosolvent water, lead rapidly goes into solution. Copper pipes are satisfactory, but have the drawback of being more difficult to install than the easily bent and soldered lead; copper is the noblest of the base metals and the small traces of copper which might go into solution would, as HOUSTON pointed out, have no harmful effect on water drinkers. Copper is in fact an essential constituent of the tissues. Another alternative is the new triple alloy of lead, tin, and cadmium, recently commended by the Non-Ferrous Metals Research Association, which seems to yield rather less lead to water than does lead itself. Its use has been sanctioned in Manchester, but it should not be forgotten that cadmium is a very poisonous metal. Private users of soft water would, it seems, be well advised to incur the rather heavy initial expense of copper or well-tinned piping.

[1] THE LANCET, August 12th, p. 374.

CEREBRAL ANGIOGRAPHY

IT is now five years since Prof. MONIZ, of Lisbon, began to study the radiological appearances of the cerebral blood-vessels after injection of opaque solutions into the carotid artery.[1] On another page will be found illustrations of normal and abnormal positions of vessels revealed in typical cases, with the conclusions which MONIZ's extensive experience has enabled him to draw from their inspection. His studies have revealed important new anatomical and physiological facts. The radiograms show that the internal carotid artery within the skull curves in a manner more complicated than has been hitherto described by anatomists. It is likely that the single or double curve, which MONIZ calls the carotid syphon, plays a considerable part in ensuring a steady non-pulsating stream of arterial blood within the cranium. By taking a series of radiograms at intervals of one second, it has been found possible to display the cerebral veins and sinuses as well as arteries, and MONIZ has therefore changed the name of the procedure from arteriography to angiography. He has also been able to show that the blood circulates much faster within the brain than in its coverings, and he

[1] See THE LANCET, 1931, i., 249: and ii., 863.

attributes this to the more rapid circulation in the cerebral capillaries.

While these observations are of great interest they do not by themselves justify cerebral angiography as a method of investigation in disease. MONIZ has found, however, that the position of intracranial tumours can often be inferred from the displacement of the cerebral arteries as shown in the radiograms. He has been able precisely to localise many tumours by this means, and moreover in vascular growths the circulation in the tumour itself is often rendered visible. The displacement that can be caused respectively by temporal, parietal, and frontal tumours is clearly shown in the radiograms illustrating his communication, and there can be no doubt that surgeons would find such pictures of immense help in deciding whether the growth is likely to be accessible and from which direction it could best be approached. The risks of any such procedure, however, have to be balanced against its conveniences. In the early attempts at cerebral angiography sodium iodide solution was used as the opaque substance, but it proved to be not wholly free from danger, especially in cases of cerebral arterio-sclerosis, in four of which hemiplegia occurred. In thorotrast MONIZ claims to have found a safe medium. It is not excreted but is absorbed by the reticulo-endothelial system, and presumably may remain in the body over a considerable period. Thus some time must elapse before we can be certain that its presence will not ultimately do harm, but as regards the absence of immediate effects, the experience of MONIZ is confirmed by that of other workers who have used it.

It is doubtful whether cerebral angiography will replace ventriculography as the main accessory method available to clinicians in the diagnosis of intracranial tumours; but in certain special cases, as for example vascular tumours, angiomatous malformations, and intracranial aneurysms, it seems to give more precise information than can be obtained in any other way, and for this reason it is likely to secure a permanent place in the methods of investigating cerebral lesions.

ANNOTATIONS

"PART TWO POISONS"

THE Home Secretary has appointed Sir Gerald Bellhouse to be chairman of the Poisons Board, whose duties are to prepare a list of substances to be treated as poisons for the purposes of the Pharmacy and Poisons Act, 1933. The constitution of the Board is given in our news columns. Lecturing to the Exeter and District Branch of the Pharmaceutical Society on Nov. 15th, Mr. H. Wippell Gadd discussed the new Act and observed that the paramount aim of all such legislation, and the standard by which it must be judged, is its effect upon the public health and safety. He explained the new system of a Poisons List divided into two parts which will not correspond with the two parts of the present schedule of poisons. The prospective "Part I. Poisons" will be those which only "authorised sellers of poisons" may sell; the "Part II. Poisons" will be saleable by other traders besides authorised sellers of poisons. Local authorities are to keep lists of these other traders and the Home Secretary may make rules as to appeals by persons aggrieved at the local authority's refusal to enter their names in the list. It would seem that anybody may have his name entered on the list unless the local authority has sufficient ground of refusal by reason of something known against him personally or against his premises. Mr. Gadd observed that this arrangement provides a much wider concession to non-qualified retailers than the old system of licensing under Section 2 of the 1908 Act. He hoped that local authorities would not be allowed to include in their lists the names of any traders who keep food shops or who, for personal reasons or on account of the nature of their premises or the character of their business, are obviously unfitted to sell poisons. He insisted that, in the interests of public safety, local authorities' lists of sellers of "Part II. Poisons" must be restricted and also that the list of those poisons must be curtailed. The Act says that in determining the distribution of poisons as between Part I. and Part II., regard must be had to the desirability of confining Part II. to "articles which are in common use or likely to come into common use for purposes other than the treatment of human ailments and which it is reasonably necessary to include in the said Part II. if the public are to have adequate facilities for obtaining them." Mr. Gadd urged that, in these times of commercial enterprise and easy and rapid means of communication and transport, it is difficult to name any poison in common use which the public have not adequate facilities for obtaining in all parts of the country; there were many poisonous substances which, if sold in ordinary shops by persons with only an elementary knowledge of their properties, would become a grave public danger.

The Departmental Committee on the Poisons and Pharmacy Acts, whose report in 1930 paved the way for the recent alteration of the law, contemplated that the new "Part II. Poisons" would include poisonous preparations used for sanitary, industrial, horticultural or agricultural purposes or as sheep-dips or vermin killers. They realised that the sale of disinfectants was an important matter of policy. The average purchaser of disinfectants for domestic and kindred purposes, they said, instead of going to a chemist and obtaining a really effective article (which, because it was a poison, he could not get elsewhere) inclined to buy from a grocer or general dealer an inferior article bearing perhaps the same or a similar name, not a "poison" but also not an efficient disinfectant. Home Office witnesses pointed out to the committee that, in a recent case of alleged murder, arsenic ostensibly for horticultural purposes had been supplied direct to the purchaser by a wholesale dealer with the result that detection was hampered by the absence of a record of the sale. The Departmental Committee believed its recommendations met all difficulties but important reservations were made by Mr. Arthur E. Young, chairman of the Retail Pharmacists' Union. Mr. Young was not prepared to agree that the creation of a new class of vendors (of the proposed "Part II. Poisons") was in any sense necessary or in the public interest. Before the passing of the 1908 Act, he said, it had been pleaded that in remote areas in Scotland the agriculturalist requiring poisons for use in his industry was under some hardship. The 1908 Act allowed the licensing of sellers of agricultural poisons but directed that the satisfaction

of the reasonable requirements of possible purchasers should be one of the considerations in granting licences. In spite of that intended limitation, hundreds of licences had been granted in urban areas, even in close proximity to chemists' shops. It is common knowledge that in many cases of the criminal use of poison the substance has been obtained in the form of agricultural or horticultural preparations. Mr. Young was entitled to protest in 1930, and Mr. Wippell Gadd to-day, that the new law confirms and even extends the wide concession which non-qualified vendors have managed to obtain. Parliament has sanctioned the change but public opinion may succeed in keeping its operation within proper limits.

CARDIOVASCULAR SYPHILIS

MODERN developments in radiology have made it possible to diagnose syphilis of the cardiovascular system more often and at an earlier stage than formerly; by means of X rays it has become possible to recognise an early dilatation of the ascending aorta and arch, to which part of the system syphilitic lesions are largely confined. Dr. O. Brenner [1] reports a series of cases in which the findings, both before and after death, are closely comparable with those of other observers. Of 102 patients, 50 showed aortic incompetence, 28 aneurysm, 14 both these lesions, and 10 neither of them. As is the ordinary experience, the usual order of appearance of symptoms was dyspnœa, angina, congestive failure; and in about 9 per cent. of cases physical signs were discovered accidentally when there were no symptoms referable to the circulatory system. Angina, commonly nocturnal, was recorded in 43 per cent., in more than half of which the aortic valve was incompetent. In a few of the cases of angina, however, aneurysm alone was found at autopsy, there being no evidence of aortic incompetence or coronary obstruction. Congestive failure is a late and grave manifestation. With it the normal rhythm of the heart is preserved, auricular fibrillation being remarkably rare in cardiovascular syphilis. Aortic incompetence was the lesion most often associated with congestive failure; in other cases coronary orifice obstruction, coexisting coronary atheroma, and aneurysm were found. Some patients with failure showed neither coronary lesions nor aortic incompetence, and in these cases there was no clear evidence that hypertension was a factor. When congestion has made its appearance the outlook is extremely bad and survival for more than a few months unlikely.

Treatment of the symptoms of cardiovascular syphilis does not differ from the treatment of the same symptoms arising from other forms of heart disease. Specific treatment designed to arrest the syphilitic process in the aorta and its valve should be cautiously used, and in the presence of angina or congestion, the intravenous arsenicals should not be given. Otherwise they may be used in small doses after an initial period of two or three months' treatment with iodide, mercury, and bismuth. There is evidence that such remedies give relief from symptoms and increase the duration of life.

HEALTH OF THE NAVY ONE HUNDRED YEARS AGO

AN interesting article by Surgeon-Captain Pickering Pick, R.N., will be found in the last quarterly issue of the Journal of the Royal Naval Medical Service. The actual period selected by Surgeon-Captain Pick for comment is the six months from April to September, 1838, at which time the state of the medical department of the Navy was receiving conspicuous attention in THE LANCET and his article is inspired by Wakley's characteristic freedom of speech. Surgeon-Captain Pick quotes statements showing that an invidious social distinction pursued naval medical officers in their career when they certainly deserved every support in their hard and ill-paid duties. When dealing with the high mortality in the Service and the conditions of rank, pay, and promotion existing among the medical officers, Wakley showed that in the list of assistant surgeons between the years 1827 and 1834 there was a loss amounting to nearly 5½ per cent. annually from death or dismissal, while the promotions in the same years amounted to 4 per cent. The figures at the time they were published were substantiated from other returns, and apparently the death-rate of these officers was three times that of the ordinary population. The question emerged in Wakley's words "what will a man give in exchange for his life, for 3*s*. 6*d*. a day, and the prospect of never being made a surgeon?"

The interests of naval medical officers 100 years ago were brought to the attention of the medical profession and to that of their seniors in the Service with remarkable force in our editorial articles, and correspondence to be found in the second volume of THE LANCET for 1837–38 makes striking reading; but although conditions to-day are so profoundly altered there is, and there always will be, room for improvement.

THE EARLY OCCURRENCE OF NERVOUS LESIONS IN POLIOMYELITIS

THE efficacy of convalescent or of pooled adult serum in the treatment of poliomyelitis is still a matter of controversy, and the burden of proof is on those who still believe that this method significantly lowers the frequency or severity of paralysis.[1] The final verdict must be given on empirical trial, but our views as to how far that trial should extend will clearly be influenced by any ancillary evidence that may become available. A finding that has an obvious bearing on the main issue has recently been recorded by Kramer and Parker.[2] These workers, having available a strain of poliomyelitis virus that was known to be infective when administered by the nasopharyngeal route, inoculated six *Macacus rhesus* monkeys intranasally on each of three successive days with a suspension of virus-containing cord. The animals were kept under careful and continuous observation, temperatures being taken twice daily. One monkey was killed on the day following the third injection of virus, and one on each day thereafter until all six had been killed. Sections of the brain and cord were cut and examined in every case. The first two animals killed had shown no signs of illness and no rise in temperature, but the brain and cord showed definite signs of involvement, including œdema of the pia, œdema and congestion of the cord, infiltration of the grey matter, areas of hæmorrhage, and occasional chromatolysis and neuronophagia of the ganglion cells. The monkey killed on the third day after the last intranasal injection showed no signs of illness, but had a raised temperature for some hours before it was killed. The involvement of the brain and cord revealed by histological examination was of the same kind as that found in the other cases, but more advanced. The monkey killed on the fourth day had had a raised temperature for 24 hours, and showed a mild tremor that became evident only on extreme exertion. The fifth and sixth monkeys showed the typical paralytic symptoms.

[1] Birmingham Med. Rev., Sept., 1933, p. 161.

[1] See THE LANCET, 1932, ii., 1063; 1933, i., 1352; 1933, ii., 420.
[2] Proc. Soc. Exp. Biol. and Med., 1933, xxx., 1417.

The central nervous system of each of these last three monkeys showed the characteristic changes of poliomyelitis.

As the authors point out, the presence of definite nervous lesions so soon after the intranasal administration of virus, and 48 hours or more before any clinical manifestation of illness, suggests that convalescent serum given after such symptoms have appeared, but before paralysis has supervened, is unlikely to have any very significant protective effect. If these findings are confirmed by subsequent workers they will clearly have to be regarded as adverse to the case for convalescent-serum therapy.

SCIENTIFIC STUDIES AT CAMBRIDGE

A REPORT of progress in the Cambridge academic year ending September, 1933, has been issued in connexion with the Rockefeller scheme for the building of the new University library and for the promotion of the study of the physical and biological sciences. From the combined resources of the Rockefeller endowment fund and the Plummer Fund large grants were made during the year towards the endowments, but the University has still to collect over £50,000 for the advancement of the scheme for physical and biological sciences; in response to the collection of this sum by the University, £105,000 will be received from the International Education Board. A special feature of the report is the note on the scheme for the new zoological laboratory, the building for which is rising rapidly, though it is probable that it will not be complete for another year. Old graduates in medicine will realise the site of the building from the description given in the report, and may be a little surprised to see that the name of the great Humphry should be misspelt in a document emanating from the Cambridge University Association.

RADIODERMATITIS AND CANCER

CLINICAL observation of the development of cancer of the skin among radiologists has prompted Dr. Antoine Béclère [1] to discuss the genesis of this condition in relation to the cancer problem as a whole. Before seeking to discover the essential cause of cancer we may ask ourselves, he says, whether it should be included among the pathological affections of external or internal origin. It is generally accepted at the present time that the various mechanical, chemical, and physical agents, and the parasites which cause cancer, do so by acting as chronic irritants setting up a chronic inflammation. As the multiplicity and diversity of these agents precludes specificity of action, further analysis of the problem—according to Béclère—depends upon the answer to the question whether alterations which result from their action stir up properties originally inherent in the injured cells or whether the condition which has been brought about favours the intervention of yet another unknown factor. According to the first hypothesis the development of cancer is the ultimate link in a long chain of uninterrupted events beginning with inflammation and going on to progressive hyperplasia. But in Béclère's view clinical study of radiologist's cancer does not lend support to continuity in the development of the process. He sees the onset of malignant change as a strange accidental event superimposed on various non-specific lesions as though suddenly a new factor had been added to the already injured skin. His reasons are first that this form of cancer occurs in only a small minority of very numerous people whose skin has been affected. Secondly, there is no parallelism between the severity of the cutaneous lesions and the appearance or absence of cancer. Finally, close examination of the actual skin lesion in no way supports a theory of chronic irritation followed by inflammation nor a gradual progressive hyperplasia ending in malignancy. The affected skin is in fact atrophic. It is silky or glossy and thin; has lost hair follicles, sebaceous and sweat glands. The general effect is of a devitalised rather than a stimulated or irritated organ provided, of course, that no complicating injury or infection is present. Radiodermatitis is in fact not an essential part of the process. When cancer develops it starts many months, or years even, after exposure, as a small circumscribed ulcer or warty excrescence at one particular spot in a relatively vast expanse of atrophic skin, every part of which appears on microscopic examination as well as to the naked eye to be identical. What is it that determines this localised origin, or predilection as it were, of malignant change for any one particular spot? Béclère postulates an additional factor of external origin—whose action is favoured by pre-existing changes. What he has once more stated is that cancer has a focal origin. Tarred mice demonstrate the same fact. Warts develop from single or multiple points of origin in a large expanse of apparently identical atrophic skin. This is one of the knotty points and stumbling-blocks of most cancer theories. In experimental skin tumours of mice and men it is not unreasonable to call in some additional external factor to account for this focal origin, but as an explanation of the focal origin of internal, spontaneously occurring, tumours it is less satisfactory.

[1] Bull. de l'Acad. de Méd., 1933, cx., 156.

PROPRIETARY HOSPITALS

IN the United States of America there are about 7000 hospitals with 1,000,000 beds representing a capital expenditure on land, buildings, and equipment of over £625,000,000. Apparently about 27 per cent. of the hospitals, including some of the largest, are owned by the central or local government authorities; they provide accommodation for persons whose segregation is desirable in the public interest—cases of communicable disease, including tuberculosis, and of mental disease—and also for soldiers, sailors, war veterans, and the destitute. With few exceptions these institutions do not receive paying patients. Nearly 40 per cent. of the remainder are non-profit, or charitable institutions, although most of them have a large proportion of paying patients; in many the fees paid amount to at least half the current expenses. Besides these there are about 2440 proprietary hospitals organised on a business basis, the profits, if any, accruing to the persons providing the capital invested. The majority of these proprietary hospitals, which are to be found chiefly in the smaller towns of the southern and western States, are owned by individuals or partnerships, but nearly 600 belong to companies formed for the purpose of providing a hospital. The proprietary hospital is usually small (the average number of beds is not more than 30), and provides general medical and surgical care; a few limit themselves to some special kind of treatment. Not infrequently it is owned and managed by a medical practitioner, and in a considerable number of cases it forms an annexe to the practitioner's consulting-room or "office." It is intended for patients who can afford to pay the cost of hospital services, and is used mainly for cases of acute illness. Non-paying patients are not admitted, but free first-aid treatment is given

in cases of emergency. Unlike the charitable hospital it is not exempt from taxation.

The arrangements for admitting a patient to a proprietary hospital are usually made by the attendant practitioner, who after consultation with the patient or his friends, engages a bed at an agreed rate, which does not include special services, such as X ray work, tests for basal metabolism, or the like. Payments for ordinary hospital services are often required to be made weekly in advance, whereas the bills of the doctors who treat the hospital patients are not usually presented till the treatment has been completed. The patient has thus two bills to pay: the first, that of the hospital, the second, that of the doctor; and of the two the latter is the least likely to be paid in full, especially if the hospital charges have been unexpectedly heavy. Occasionally unedifying disputes arise between the hospital and the doctor as to the adjustment of their respective charges. Still more unedifying is the arrangement, which is said to obtain in some hospitals, whereby a doctor who has recommended a patient to enter a certain hospital receives by way of commission a part of the hospital charges paid by the patient. Such arrangements, which are of the nature of fee-splitting, are strongly condemned by representative organs of medical opinion in America, and various methods have been suggested to discourage them and to enforce a higher standard of ethical practice. Largely for this purpose an incorporated organisation has recently been established in New York, known as the Association of Private Hospitals Inc., members of which sign a pledge to "(*a*) maintain the highest efficiency in our service; (*b*) maintain an open hospital to which accredited physicians and surgeons may send patients . . . ; (*c*) do everything in our power to combat the evils of fee-splitting among the physicians and surgeons working in our institution." The hospital authorities pledge themselves also not to rebate any part of a patient's hospital charges to the doctor attending him.

THE EFFECTS OF POSTURE ON HEART-RATE AND BLOOD PRESSURE

THE changes in pulse-rate and blood pressure which accompany alterations of posture have usually been attributed to concomitant variations in the cranial and splanchnic blood pressure, but Prof. J. A. MacWilliam [1] reports observations which cannot be thus explained. It is now recognised that other mechanisms are concerned in the regulation of pulse-rate and blood pressure—notably afferent impulses from the vena cava and right heart, which are generated when the internal pressure increases and causes the heart to beat faster, and also afferent impulses from the carotid sinus produced by increase in pressure within the artery and leading to cardiac slowing. MacWilliam finds that the chief effects of carotid sinus pressure in the normal person are slowing of the pulse, weakening of its beats, fall in blood pressure, and weakening of the heart and arterial sounds. The readiness with which these reactions are evoked seemed to vary considerably during the course of the day and also from day to day; indeed, during a single day the sensitiveness of the reflex may alternate several times, though one of its most constant features was the activity of the reflex on waking in the morning. Variation in the effect of change of posture on pulse-rate may perhaps be associated with different phases of activity of the carotid reflex. An exaggerated carotid reflex, in conjunction with a similar response from the vaso-motor centre, may lead to over-compensation when the subject lies down; this means excessive slowing of heart-rate with fall in blood pressure and giddiness is induced. Changing from the sitting to the standing posture usually resulted in acceleration of the pulse, and MacWilliam shows this to be dependent on hydrostatic effects which occur when the thigh is moved from the horizontal to the vertical; altered tension in muscles plays no part in bringing about the change. Artificial venous congestion of a leg produces acceleration of the pulse when the subject is sitting or standing, but not when he is lying. Slight continued movements of the legs when the subject is standing brought about a definite slowing of the pulse as compared with the rate when standing motionless. These effects are presumed to result from afferent impulses from the leg, and are not the direct result of alterations in blood flow. Similarly, experiments suggest that the blood pressure adjustments which are necessary in the standing position are affected by afferent impulses from the lower limbs. In conclusion MacWilliam says that "it remains to be seen whether a study of postural effects can give information as to developing defects of coördination and control in the vascular system, leading up to conditions of persistent high or low blood pressure, and whether when abnormal levels have been established any differentiation of types is practicable."

[1] Quart. Jour. Exper. Physiol., 1933, xxiii., 1.

INDUSTRIAL LEGISLATION

THE members of the Home Office Factory Inspectors Department celebrated the centenary of their establishment on Nov. 10th by a dinner which was attended by the Prince of Wales and the Home Secretary. It will be remembered that the first efforts at official control of working conditions were made in 1802 when the Health and Morals of Apprentices Act was passed. The aim of the early measures introduced was cleanliness and some limitation of the hours of labour for children, and the fixing of the age for employment at not less than nine years. These so-called "apprentices" passed their lives in the mills where they were clothed, fed, and housed; their fate was to be awakened by being beaten and to be kept awake by the same means. If they escaped, they were pursued on horseback and hauled back to work, and, maybe, to succumb to "mill fever," as typhus was then often called. The early Acts were however mostly ineffective for lack of means to enforce them, until 100 years ago State-paid inspectors of factories were appointed, armed with powers of entry into the mills and entrusted with the duty of enforcing legal requirements. These were the days when the ten-hours controversy raged and Michael Sadler said in the House "You have limited the labour of the robust negro to nine hours; but when I propose that the labour of the young white slave shall not exceed ten, the proposition is deemed extravagant." Steadily the Factory Acts were strengthened, but the cynic may note that the land-owners who held all power in Parliament at the beginning of the century and resented the growing wealth of the new mill-owners, enacted the early Factory Acts as a means for keeping their rising rivals in their place; that adult male labourers strongly supported the ten-hour Act which would, it was thought, by limiting the hours of the lowly paid labour of women and children, improve their own position; and that, even in these later days, the cause of industrial welfare has often been advocated by philanthropic employers, less because of any realisation that their consideration for their work-

people is in fact a business asset, but in order that their rivals shall also be called upon to incur the expense of welfare provisions. But the encouraging fact remains that throughout the 100 years the State inspectors of factories from inside knowledge have been able to provide information and make proposals upon which progress has been based. And at the same time they have gradually come to be regarded less and less as inquisitorial prosecutors and more and more as friends and advisers. Gone are the days of such abuses as "time-cribbing," when mill machinery was run for a few minutes before and after the legal limit, while scouts watched for a possible raid by an inspector who in his turn would conceal himself in some tradesman's cart or maybe in a passing hearse. To-day employers seek advice regarding rest pauses and the length of shifts, appreciate the human factor in accident causation, and inquire about the best ways of removing dangerous dust and fumes. Meanwhile protective legislation, notwithstanding eddies and backwaters, flows steadily onward to its objective, and is being extended well beyond the bounds of factories. The urgent need of legislation to limit the hours of boys and girls in distributive trades and in hotels, restaurants, and eating-houses is now being considered by the Home Secretary, whose sympathetic answer last week to the chairman of the Committee on Wage Earning Children gave much satisfaction. The long hours during which these young people are on duty is generally deplored, and it may be hoped that the negotiations now in progress between the Government and the interests concerned will have a useful and speedy outcome.

SINUSITIS IN SCARLET FEVER

Otitis media is one of the common complications of scarlet fever and according to G. D. Hoople and L. S. Cave [1] is usually accompanied by sinusitis. Two series of cases were studied in the City Hospital, Syracuse, New York. In the first, the sinuses of 292 scarlet fever patients were examined with X rays and results were obtained which prompted further investigation. In the second group, comprising 80 patients, examinations were made on admission by a pædiatrist, A. C. Silverman, by Hoople and Cave as otolaryngologists, and, as soon as possible, by a radiologist, D. S. Childs. The findings were recorded independently, being compared later, and similar examinations were made just before the patient's release from hospital. Those examined were fair samples, as regards age- and sex-incidence and seasonal distribution, of the cases of scarlet fever occurring in the city as a whole. Radiograms were described as "clear" when no shadow could be made out in the sinuses, and as "thickened membrane" when there was a shadow in one or more of the sinuses not dense enough to be placed in the third category of "retained secretion." In the first series, 91 per cent. of the cases showed some shadow in the sinuses, most of these being interpreted as thickened membrane. In only 9 per cent. were all the sinuses clear. Most often involved was the antrum, and next in order the ethmoidal and frontal sinuses. The sphenoidal sinus was not examined. Of the 292 patients, 33 (11·3 per cent.) had otitis media and all of these had sinus involvement on the corresponding side; indeed, in 26 of the 33 cases there were bilateral shadows even if only one ear was involved. In the second series of 80 cases, which contained only 7·5 per cent. of severe clinical types of scarlet fever as compared with 20 per cent. in the first, 91 per cent. showed radiographic evidence of sinus involvement. On admission 12 films were clear (11 of these patients were over seven years of age), 61 showed thickened membrane, and 7 retained secretion. On discharge from hospital these figures became 22, 56, and 2 respectively. Patients from whom "clear" films were obtained on admission showed clinical evidence of sinusitis in 7 instances; in the "thickened membrane" group there was clinical evidence in 46; and in the "retained secretion" group in 4 patients. In explanation of the discrepancies between the radiological and clinical findings Hoople and Cave point out that the examinations were made at different times and that clinical evidence of sinusitis present on one day may be lacking on another. In the second series 12 patients (15 per cent.) had otitis media and in only two of these was there no *clinical* evidence of sinusitis. Incidentally it was found that the incidence of sinusitis was proportionately greater in tonsillectomised patients. Another question considered is the relation of sinusitis to contact ("return") cases. The investigators point out that if all patients with sinusitis at the time of discharge from hospital were possible sources of infection the number of contact cases would be very high. It may be, they think, that the thickened membrane represents only a residual reaction to the past infection, "something that will subside in a few days." In any case they suggest careful clinical scrutiny aided by radiograms of the sinuses before release of the patient from hospital. No special treatment was adopted for sinusitis. As little as possible was done in the acute stages and it was found that little had to be done later on.

[1] Jour. Amer. Med. Assoc., Oct. 7th, p. 1121.

Dr. Charles Slater has given to St. George's Hospital £10,000 with which to build a new clinical laboratory at a fitting time, the interest to be used meanwhile for the support of the existent laboratory.

Sir Leonard Rogers, F.R.S., I.M.S., retired on Tuesday from his position as medical adviser to the Secretary of State for India and president of the India Office Medical Board, having reached the age limit. He has been succeeded by Sir John Megaw, director-general of the Indian Medical Service. Sir Leonard Rogers will continue his research and his work for the British Empire Leprosy Relief Association.

Dr. M. H. MacKeith, Fellow of Magdalen College, Oxford, has been appointed dean of the new British Post-Graduate Medical School at Hammersmith, and will take up his duties there in the new year. Dr. MacKeith qualified from Guy's Hospital in 1921, and is at present demonstrator of pharmacology and dean of the medical school in the University of Oxford. The governing body of the school at Hammersmith announce their hope that it will be open to students towards the end of 1934.

Dr. John Beattie, who has been appointed, in succession to Sir Arthur Keith, Conservator of the Museum and Director of Research at the Royal College of Surgeons of England, is associate professor of anatomy at McGill University, Montreal. Dr. Beattie, who is 34 years old, was educated at the Royal Academic Institute, Belfast, and qualified with first-class honours from Queen's College in 1923, taking the gold medal at the M.D. examination in 1927. He is also M.Sc. and D.Sc. of Belfast University. He has been research assistant and demonstrator of anatomy at University College, London, and in 1925 held the Mackay Wilson Travelling Scholarship. His recent published papers bear on the hypothalamic mechanism and the tuber cinereum.

THE PREVENTIVE ASPECTS OF MEDICINE

A Series of Lectures in progress during the Winter Session at King's College Hospital Medical School

VI.—PREVENTION OF DISEASE IN THE PRE-SCHOOL CHILD

IF we are prepared to accept, with Sir Arthur Newsholme, that the curtailment of illness and the decrease of suffering come within the scope of preventive medicine, we find that preventive and clinical medicine have a common meeting ground, and are in fact inseparable. Taking this broad view of preventive medicine, there are several ways in which a doctor may practise the preventive aspect of his calling.

The first and most desirable form of prevention is to advise a patient on such lines as shall forestall the appearance of disease; we see an example of this in infancy in the administration of orange juice as a prophylactic measure against infantile scurvy, or in the use of cod-liver oil to prevent rickets. Secondly, a course of treatment may be recommended in order to create in the patient a specific immunity to certain diseases; examples of this in childhood are vaccination against small-pox and immunisation against diphtheria. Thirdly, by diagnosing disease in its initial stages it may be possible to begin treatment early enough to thwart the natural course of the disease and alter the prognosis vastly for the better. The importance of early diagnosis in the illnesses of childhood may be illustrated by diphtheria, in which the prognosis is materially affected by the time that elapses between the first appearance of the infection and the administration of anti-diphtheritic serum; and by hypertrophic pyloric stenosis, in which the recovery-rate varies inversely as the time that elapses between the onset of symptoms and the institution of proper treatment. Fourthly, when a disease has already established itself, the avoidance of complications and sequelæ is a preventive measure of much importance. Thus the thorough treatment of acute infections of the throat and ear will do much to prevent conditions such as chronic nasal catarrh and otorrhœa, while a period of good convalescence at the seaside or in the country after measles, whooping-cough, or broncho-pneumonia is invaluable as a means of preventing the chronic pulmonary catarrh which so often follows these diseases.

SORE-THROAT

Turning now to some of the common ailments of young children I mention sore-throats first, because it so often happens that chronic disorders such as otorrhœa, catarrhal rhinitis, and recurrent bronchitis owe their origin to repeated infections of the pharynx.

The term "sore-throat" has been used intentionally instead of tonsillitis because a sore-throat may readily occur after the tonsils have been removed, and because a day or two of fever with swelling and redness of the pharynx may be almost as fruitful a source of complications as a more frank tonsillitis. There is no means of estimating the incidence of sore-throats among children, because they are often mild enough scarcely to give rise to symptoms, and so pass unnoticed, while parents are apt to look upon them as something inevitable but on the whole harmless, and so medical advice is not sought.

It is often surprising how slight may be the symptoms when examination shows considerable inflammation of the throat. A young child is not likely to complain of soreness, and while there may be vomiting and anorexia these are not to be relied upon. The temperature is, however, invariably raised a few degrees, and it is only by making a routine examination of the throat in all children who are found to be feverish that sore-throats will not be overlooked. In the milder infections the temperature may return to normal within 24 hours, and even when there is a purulent exudation on the tonsils the temperature should fall sharply to normal within 72 hours. If this does not happen, it should be a warning that some complication is brewing, such as, for example, a peritonsillar abscess, suppuration in the cervical glands, or acute otitis media, and the child should be carefully watched so that these complications may be dealt with at the earliest opportunity, and the more chronic results of neglected sore-throats (otorrhœa, chronic nasal catarrh, and so forth) may be prevented.

At the present time, what happens too often to the pre-school child is that if the sore-throat is treated at all, it is dealt with by home remedies, often with the child up and about the house and mixing with other children, instead of being in bed. Delayed and imperfect recovery is a common result, complications arise more readily and are likely to be overlooked, and by the time the child begins schooling and undergoes his first medical inspection by the school medical service he is already suffering from chronic ill-health.

The complications already mentioned come about from direct spread of the infection from the throat to neighbouring tissues, but not less important are the complications that arise from one to three weeks after the throat infection, and appear in distant parts of the body.

The two most important are nephritis and acute rheumatism. The appearance of blood in the urine or puffiness of the face will bring the nephritic child quickly under medical care, but this is not the case with acute rheumatism, unless it should happen that the joints are acutely involved. Figures from the rheumatism clinic at the Hospital for Sick Children, Great Ormond-street, showed that the onset of heart disease passed unnoticed in 13 per cent. of the children with rheumatic carditis, and the state of the heart was only noticed on routine examination after the damage had already been done. One cannot doubt that some at any rate—and perhaps the majority—of these followed sore-throats, and if medical advice had been sought at the time and the illness of that throat had been properly followed up, much damage to the heart might have been avoided. It may be mentioned here that experience at the special convalescent homes for rheumatic children has shown that the degree of the inflammation of the throat is no guide as to the likelihood of rheumatic sequelæ, severe carditis being often a sequel to a relatively mild faucial inflammation.

It has long been recognised that the onset of rheumatic heart disease is often coupled with a history of tonsillitis or sore-throat. During the last few years the segregation of rheumatic children in special heart homes, where observation of the children can be carried out over long periods, has led to a better understanding of the close relation between these diseases, and B. Schlesinger (1930) and later myself (1931) have been able to show that there is generally an interval of roughly 7 to 21 days between the sore-throat and the development of acute rheumatism. During this interval the child seems well, and under the ordinary circumstances of the private house would probably pass from medical care before the rheumatic manifestations appeared.

The bacteriology of these preliminary sore-throats has been studied, and evidence is accumulating (A. F. Coburn (1931), W. R. F. Collis (1931), W. H. Bradley (1932), and Glover and Griffith (1931)) in support of the view that when rheumatic carditis follows a sore-throat, the sore-throat is the result of hæmolytic streptococcal infection.

This should occasion no surprise when it is remembered that rheumatic carditis has been recognised for years as one of the sequelæ of scarlet fever—a disease now known to be due to infection of the throat by hæmolytic streptococci.

The prevention of a disease which leads to so much invalidism as does rheumatic carditis requires no advocate, and it may well be that during the sinister period—silent of symptoms—that elapses between the sore-throat and the appearance of rheumatic manifestations, we have an opportunity to attempt preventive measures. A sore-throat in a child should be looked upon as a warning that acute rheumatism may follow, especially if the sore-throat is attributable to hæmolytic streptococcal infection. At the present day, when a throat swab is sent to the laboratory, the bacteriologist is usually asked simply to say whether diphtheria bacilli are present or not. The question should be amended to: Are diphtheria bacilli or hæmolytic streptococci present? If the report shows the presence of hæmolytic streptococci, two results should follow. Firstly, the child should be isolated (if that has not already been done) until the inflammation of the throat has disappeared and the temperature has fallen to normal; secondly, the child should be kept under medical observation for a month, in order that any cardiac involvement might be promptly realised and treated. Older children need not be kept away from school all this time, but during their month of supervision the heart should be examined at least every week, either by a private doctor or perhaps in some cases by arrangement with the school medical service. Of course rheumatism does not follow all hæmolytic streptococcal sore-throats; it only follows in about 5 per cent. of cases of scarlet fever, and so far as we know there is no reason to suppose that its incidence after non-scarlatinal hæmolytic-streptococcal throats would be greater.

To diagnose rheumatic carditis at its inception may fairly be looked upon as a preventive measure, for it is likely that the outlook will be benefited by prompt treatment. Whether anything more definitely prophylactic can be done during the "silent period" is at present uncertain, but in children who have already had one attack of rheumatism and then get a sore-throat, experience at West Wickham Heart Home and at Cheyne Hospital has suggested that aspirin (grs. 15—30 per diem according to age) given during the silent period immediately after the sore-throat may have a modifying effect upon the ensuing rheumatic exacerbation.

TUBERCULOSIS

I mention tuberculosis next because it is one of the most frequent causes of death in childhood. In 397 consecutive autopsies made by me at the Hospital for Sick Children, death was due to this disease in 17 per cent. Moreover, the young child has practically no immunity against tuberculosis, so that if exposed to infection, he will almost inevitably develop the disease.

The question of preventing this grave disease is bound up with its paths of infection. To all intents and purposes, a child is likely to be infected by one of two routes; either by the inhalation of particles of infected sputum from a phthisical person, or else by the ingestion of infected food, particularly milk. The inhalatory route is the more common; in the series of autopsies referred to above, infection was by the intrathoracic route in 67 per cent. of the deaths from tuberculosis—a figure which compares closely with that obtained by G. F. Still, who found that in a series of 269 children dying from tuberculosis, infection was by the intrathoracic route in 63·8 per cent.

The prevention of *intrathoracic tuberculosis* in young children depends on shielding them from contact with phthisical adults. It may be safely assumed that any young child who is brought up in a household which harbours one member with a positive sputum will inevitably become infected, and for infection to take place it is only necessary for the adult to stay in the house for a week or two. The chance of infection of young children in this way cannot be entirely prevented, for a child may already be infected before the disease in the adult is discovered, but clearly there are certain rules which should always be observed. Thus, no adult known to have phthisis should be allowed to stay in a house where there are children; and the appearance of tuberculosis in an adult who is living in a house where there are children should mean that either the adult or else the children should be taken to live elsewhere. Perhaps it would be possible to send the children away to be brought up by relatives, but it is better for the adult to be sent away to an institution or sanatorium for treatment. The children should also undergo a thorough medical examination, and to begin with, a holiday at the seaside or at a convalescent home would be a sound precautionary measure.

As to *infection by milk*, this can be prevented by sterilising the milk either by boiling or pasteurisation. Unless the milk happens to be obtained from a herd of certified tuberculosis-free cattle (for which the consumer has to pay a high price), milk given to children should *always* be sterilised by one of these two methods. Much of the milk-supply in our large cities is now pasteurised before delivery, and a considerable advance in the prevention of tuberculosis would result if this were made compulsory. Pasteurisation in the home is best done with special apparatus, and in any case needs care and intelligence, so that it is generally wiser to recommend sterilisation of milk in the home by the more simple method of bringing the milk to the boil.

Mothers who have carried out this precaution for their infants often ask how long they should continue with the boiling of the milk, and the answer should be—throughout childhood. There is surely no point in exposing older children to risks from which they have been shielded in infancy. The argument that small doses of tubercle bacilli in the milk may assist the child to build up an immunity is a treacherous one, for there is no means of regulating the dose of bacilli which might reach the child in this way, and further, the majority of children will almost certainly encounter enough bacilli by the inhalatory route to arouse their immunity mechanism.

Before leaving this subject, mention must be made of the important part which measles and whooping-cough play in promoting tuberculous infection in the chest. These diseases reach their maximum incidence during the pre-school years, and at this age it is not uncommon to see a child whose convalescence from them has been protracted and unsatisfactory, who has remained feverish and gradually lost weight, while signs have remained in the chest and have eventually culminated in a tuberculous catastrophe. It may be that the swelling and congestion of the mediastinal glands that occurs in these diseases lights up a dormant tuberculous focus in them, while the catarrhal state of the lungs which often persists after these illnesses offers a suitable nidus for the development of a tuberculous lesion. It follows that too much attention cannot be paid to thorough convalescence after measles and whooping-cough. Merely

a week at the seaside, or the increasingly common practice of the family going by car to the seaside each week-end, gives a false sense of security and is quite insufficient. The child should be away at the sea or in the country for a minimum of six weeks, and during that time fresh air and daily exercise should be balanced by an hour or two of rest in the middle of the day. Cod-liver oil and Parrish's Food are useful adjuncts, but they do not take the place of a change of air.

INDIGESTION

Chronic indigestion is a common disorder in the pre-school child, and the symptoms show a wide range. They may point directly to a disturbed digestive function, and then include loss of appetite, failure to thrive, and the passage of undigested, slimy, offensive stools. Other common symptoms include perversions of appetite, such as "drinking all day," or eating raw vegetables, paper, or coal; persistent threadworm infection; daily pyrexia of a degree or so; or disturbances of sleep, such as bed-wetting and night terrors.

There are three principal factors that lead to chronic indigestion, and by giving attention to them, many of the symptoms which I have outlined can be prevented.

Unsuitable diet.—The diet often errs in that the child is given too much starchy food such as potato, bread, and the root vegetables, which leads to excessive bacterial fermentation, and the passage of loose, offensive motions. Often these foods are composed of much indigestible cellulose, which remains in the bowel as "roughage." This class of food has sometimes been recommended in the treatment of chronic constipation, but though it may be a useful line of therapy for adults, in children it does more harm than good. The residue from this diet is bulky and irritating to the large intestine, which reacts by secreting large amounts of mucus. Peristaltic movements then become less effective, and the stools when passed are hard and lumpy, and contain much undigested material and often masses of whitish mucus. Foods that when given to excess offend in this way are the root vegetables, such as carrots and turnips, dried peas and beans, especially haricot and butter beans, nuts, coarse oatmeal, wholemeal bread, and raw fruits containing skins and pips. The mucous catarrh of the bowel which this type of diet engenders seems to be particularly conducive to the persistence of threadworm infection; almost always one finds that children with a resistant threadworm infection are passing undigested and slimy motions, and the infection is difficult to overcome until these irritating elements in the diet have been reduced or removed.

Mismanagement.—This includes such obvious faults as allowing the child to eat as much as he likes of whatever he likes whenever he likes. Every child is entitled to have certain likes and dislikes; for instance some children will not touch an egg, others cannot bear even the sight of green vegetables on their plate, and the fat of meat is often refused. It is better to recognise these peculiarities, and to replace the unwanted food by other foods having a similar nutritional value, rather than to attempt to force the child to take what he obviously dislikes. Other children will be content to eat heartily of one particular foodstuff—often rather harmful to them—to the exclusion of others, and to allow an indulgence of this sort constitutes mismanagement.

Chronic infection of the nasopharynx.—This is not uncommonly associated with chronic indigestion, the latter being probably due to the constant swallowing of infected mucopus from the pharynx. Early morning cough, or the vomiting of mucus before breakfast, are likely complaints. The prevention of these symptoms will depend upon a thorough treatment of acute infections of the throat in the first place, and perhaps later on the removal of persistently infected tonsils.

BILIOUS ATTACKS (CYCLICAL VOMITING)

Under this heading I include attacks which are ushered in by a day or two of loss of appetite, lassitude or irritability, with furred tongue and offensive breath, followed by vomiting which is usually severe and lasts two or three days, accompanied by high fever and acetonuria. Occasionally a periodic fatty diarrhœa takes the place of the vomiting.

The prevention of these attacks is largely a matter of diet, which should be low in fat content and high in sugar. The fat of cow's milk is particularly troublesome, and the milk should always be skimmed before it is given to children with this sort of complaint. Cream should be entirely omitted, and the number of eggs should not be more than two a week. The various courses should be sweetened whenever possible, and honey, jam, and treacle should be regular items of the diet. Additional glucose after the meal is a useful adjunct, but is of little value in the absence of the other dietetic modifications. Any attempt to feed up these children, particularly with extras like cod-liver oil, should be strongly discouraged. Sodium bicarb. in grs. 20 doses twice a day has been found useful in the prevention of these attacks.

DENTAL CARIES

To anyone working much with children, the frequency of caries of the teeth must be most striking. The work of M. Mellanby, and C. Lee Pattison (1928) and others in the last few years has established the fact that much dental decay is undoubtedly preventable, and the application of this new knowledge should lead to a considerable lessening of dental troubles in the children of the future. It is often surprising how much decay of the teeth of the first dentition may exist without complaint of toothache, and this may perhaps account for the frequency with which parents are ignorant of, or disregard, the fact that their children's teeth are decayed. Yet there can be no doubt that disease of the milk teeth gives rise to much disorder of health, including anorexia, chronic indigestion, and sometimes habit spasms. Infection of the tooth socket by streptococci and other organisms is not uncommon, and may lead to apical abscesses or sometimes cause such distant effects as rheumatism.

The prevention of dental caries should properly begin at a time when the teeth are still forming within the jaw and are undergoing calcification, because the better the tooth at the time of eruption the more able is it to resist caries. It has been shown that diets that contain adequate supplies of vitamin D greatly stimulate the calcification of teeth, while cereal diets, particularly oatmeal, lead to the formation of hypoplastic poorly calcified teeth.

The teeth of the first dentition begin to calcify as early as the fifth month of intra-uterine life, and from then on calcification progresses rapidly. It follows that in order to ensure the eruption of a well-calcified set of milk teeth, attention should be directed to the maternal diet, seeing that the mother during her pregnancy does not undergo a shortage of such foods as milk, eggs, and butter, which contain vitamin D. But the prevention of caries in the first dentition does not stop there, for the workers referred to above have shown that the initiation and spread of

caries in children can be limited by incorporating vitamin D in their diet, while on the other hand a cereal diet with a low vitamin content tended to have the opposite effect. They were also able to show that when caries had begun, a diet rich in vitamin D tended to arrest the process by producing a "hardening" of the teeth.

If we consider for the moment only the milk teeth, it is clear that the care of the teeth means among other things the supervision of the diet, not merely in infancy, when already much attention is paid to vitamins, but during the whole of the pre-school period as well, to see that as far as possible the diet shall not be composed mainly of cereals (which on account of their cheapness and bulkiness are apt to be the main constituent of the diet in the poorer homes), but that the amount of cereal shall be adequately balanced by foods containing vitamin D. During these years a child should have a pint of milk a day, three eggs a week, and at least ½ oz. of butter a day, and preferably double that amount. If the home circumstances are such that a deficient diet is likely, a teaspoonful of a cod-liver oil emulsion should be given twice a day during the winter months.

It must not be supposed that by giving attention to the diet to prevent caries, the customary hygiene of the teeth—such as cleaning them twice a day—may be neglected. But it is not uncommon to see children whose teeth, in spite of scrupulous cleaning, are badly decayed, while others who have not taken the same care have a good set of strong teeth. No amount of cleaning can undo the harm wrought by a bad diet.

The remarks made concerning the prevention of caries in the first dentition apply with even greater emphasis to the permanent dentition. The first tooth of the second dentition begins to calcify a short time before birth, and except for the wisdom teeth, all the others of the second dentition begin to calcify during the first two years, and calcification goes on throughout the pre-school period; so that if during this time the diet is supervised along the lines indicated above, not only will the prevention of caries in the milk teeth be attempted, but the best foundation will be laid for ensuring a healthy set of permanent teeth.

POLIOMYELITIS

Although the deformities of poliomyelitis may be met with at all ages, the onset of the disease attains its maximum incidence between the ages of 2 and 5 years; the amount of crippling and invalidism caused by poliomyelitis makes its prevention eminently desirable.

Several years ago S. Flexner and A. J. Lewis (1910) showed that the serum of patients who were convalescent from poliomyelitis contained protective substances which could prevent the development of paralysis in animals after they had received inoculations of the virus, and recently this work has been applied to the disease in the human subject with encouraging results. There are two difficulties in the preventive use of poliomyelitis serum. In the first place there have been no large stores of serum on which a doctor could draw, and secondly the serum, to be effective, needs to be given during the acute febrile stage of the disease before the appearance of paralysis, and until recently the possibility of diagnosing the disease in its preparalytic stage has scarcely been realised. During an epidemic of the disease, early diagnosis would be less difficult, but the majority of cases in this country occur sporadically. The disease has its greatest incidence in the third quarter of the year, and during this period the possibility of the infection should be particularly borne in mind.

Preparalytic stage.—According to J. M. Smellie (1933) this stage only lasts a day or two, during which time the temperature is raised and there is headache, with perhaps pains in the back or limbs, and there may be vomiting or drowsiness. The most suggestive sign is stiffness of the neck muscles, not amounting to retraction of the head, but enough to prevent any movement which requires full flexion of the neck or spine. These symptoms are unfortunately very vague, but examination of the cerebro-spinal fluid may settle the matter, and therefore when there are grounds for a healthy clinical suspicion a lumbar puncture should be carried out.

The cerebro-spinal fluid is under increased pressure, and the cells are increased to between 50 and 200 per c.mm., the type of cell being mainly polymorphonuclear at first, and later lymphocytic. The protein is raised, the chloride value remains unaltered, the sugar is unaffected, and culture is sterile. The differential diagnosis from tuberculous meningitis may offer considerable difficulty, but the short clinical history in poliomyelitis and the usually reduced chloride value of the cerebro-spinal fluid in tuberculous meningitis are important distinguishing features.

As soon as the diagnosis is made no time should be lost in giving convalescent serum. It should be given intrathecally in an amount slightly less than the amount of cerebro-spinal fluid that has been withdrawn, and a second injection should be given intravenously, the total varying between 25 and 50 c.cm. Information concerning the available supply of serum has been given in THE LANCET of Oct. 14th, 1933, p. 874. Outfits containing enough serum for the treatment of one case can be obtained from the medical superintendent of the Western Hospital, Seagrave-road, Fulham, London, S.W.6, on condition that an account of the case and the result of treatment are subsequently furnished. A prophylactic antiserum prepared from the horse by the Lister Institute of Preventive Medicine is also available, and may be given to those who have been exposed to infection, particularly during an epidemic, and for this purpose an intramuscular injection of 5 c.cm. is recommended.

WILFRID SHELDON, M.D., F.R.C.P.
Physician in charge of the Children's Department, King's College Hospital.

THE SERVICES

ROYAL ARMY MEDICAL CORPS

Lt. (on prob.) R. V. Wright retires on account of ill-health.

TERRITORIAL ARMY

Capt. T. E. A. Carr to be Maj.

Lts. H. A. Raeburn and W. P. Kennedy to be Capts. supern. for serv. with Med. Unit, Edinburgh Univ. Contgt., Sen. Div., O.T.C.

Lt. P. J. May to be Capt.

J. B. Fulton (late Cadet, Glasgow Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS

Capt. W. W. Brown, from Active List, to be Capt.

INDIAN MEDICAL SERVICE

Col. Sir R. McCarrison to be Maj.-Gen.

Capt. F. E. B. Manning to be Maj.

Capt. M. S. Katre relinquishes his temp. commn.

ROYAL AIR FORCE

The undermentioned Flying Officers are promoted to the rank of Flight Lt.: E. Donovan and J. F. Sandow.

COLONIAL MEDICAL SERVICE

Dr. H. B. Lee (Medical Officer) has been promoted to Specialist, Nigeria; and Dr. P. D. Oakley (Deputy-Director, Medical Service, Gold Coast) becomes Director of Medical and Sanitary Services, Sierra Leone.

SPECIAL ARTICLES

ROYAL COLLEGE OF SURGEONS OF ENGLAND

THE BUCKSTON BROWNE DINNER

THE sixth Buckston Browne annual dinner of Fellows and Members was held as usual in the library of the College on Nov. 8th. Before the loyal toast, Sir Holburt Waring, who presided, circulated the ample loving-cup presented by Lord Riddell to the College since the last annual gathering, in token of good fellowship and sacrifice. Later in his brief remarks Sir Holburt referred again to the revision of the medical curriculum, expressing a hope that the report of the conference with the sister College and the universities of Oxford, Cambridge, and London would soon be issued and a beginning made with the correlation of the preliminary and intermediate subjects, and with putting the clinical subjects on a more scientific basis. He said that in future the College, before admitting to the Fellowship Examination, would require each candidate to have held a resident post with charge of beds in a hospital for a period of six months. He recalled the formal opening last July of the Surgical Research Farm at Downe, with Sir Arthur Keith in charge as Master, and the link between the work there and the two Leverhulme studentships held at the College. Sir Buckston Browne, in reply to the toast of his health, spoke of the inauguration of the Research Farm as the realisation of Sir Arthur Keith's wish, marking the transition from the dry-bone tradition to the more direct study of the mystery of life. The following is a list of those present :—

Council.—Prof. G. E. Gask and Mr. Wilfred Trotter (Vice-Presidents), Mr. Ernest W. Hey Groves (Bristol), Sir Cuthbert Wallace, Mr. F. J. Steward, Mr. C. H. Fagge, Mr. R. P. Rowlands, Mr. W. Sampson Handley, Mr. A. H. Burgess (Manchester), Mr. Victor Bonney, Mr. Hugh Lett, Mr. R. E. Kelly (Liverpool), Mr. Graham Simpson (Sheffield), Mr. A. James Walton, Mr. A. E. Webb-Johnson, Mr. G. Gordon-Taylor, Sir Charles Gordon-Watson, Mr. R. C. Elmslie, Mr. L. R. Braithwaite (Leeds), and Mr. H. S. Souttar.

Fellows.—Mr. J. Johnston Abraham, Sir Charles Ballance, Major B. Biggar, Mr. R. C. Brock, Sir Buckston Browne, Mr. E. Rock Carling, Mr. W. E. Le Gros Clark, Mr. Harold Collinson (Leeds), Sir Crisp English, Mr. G. F. Gibberd, Mr. A. M. H. Gray, Mr. Eardley Holland, Mr. John P. Hosford, Mr. Grant Massie, Sir George Newman (Honorary Fellow), Mr. Harry Platt (Manchester), Mr. Cyril A. Raison (Birmingham), Mr. Hugh Reid (Liverpool), Mr. E. W. Riches, Mr. F. W. Roques, Mr. C. E. Shattock, Mr. Harold Upcott (Hull), Mr. P. Jenner Verrall, Mr. Cecil P. G. Wakeley, and Mr. Duncan Wood (Bristol).

Members.—Dr. C. W. Alford (Chelmsford), Mr. J. W. Applegate (Dewsbury), Dr. E. A. Barton, Dr. Arthur Bevan, Dr. H. N. Burroughes, Mr. Frank Coleman, Group Capt. Henry Cooper, Mr. Frank Corner, Dr. H. P. Crampton, Dr. David de Souza, Prof. E. C. Dodds, Dr. H. Farncombe (Southsea), Dr. Alfred Franklin, Mr. A. P. Gibbons, Dr. C. Gibson (Worthing), Dr. Sydney J. Haylock (Bournemouth), Dr. R. J. Hodgkinson (Hindhead), Dr. N. G. Horner, Dr. T. C. Hunt, Mr. H. H. Langston, Dr. H. B. Logan (Bristol), Mr. H. A. Lucas, Dr. W. J. McCardie (Birmingham), Dr. Oswald Marriott (Haywards Heath), Dr. W. N. May (Reading), Dr. Frederick Mayes (Bristol), Dr. Egbert Morland, Prof. R. Hughes Parry (Bristol), Mr. T. J. Phillips (Harrow), Mr. A. T. Pitts, Dr. A. R. Pocock, Dr. H. Rivers Pollock, Dr. E. A. Blake Pritchard, Dr. Russell J. Reynolds, Mr. D. G. Rice-Oxley, Dr. Redmond Roche, Dr. W. M. Sadler (Slough), Mr. V. C. Snell, Dr. J. F. Taylor, Mr. H. de P. B. Veale (Ilkley), Mr. J. F. Walker (Southend), Dr. W. G. Willoughby (Eastbourne), Dr. H. Yates (Alton), and Mr. A. P. Yonge (Twickenham).

Others present.—Lord Riddell, Sir Frederick Menzies, Dr. Tom Hare, Mr. T. McCown, Mr. S. Forrest Cowell (secretary), Mr. R. H. Burne (acting conservator), and Mr. Kennedy Cassels (assistant secretary).

After dinner, as usual, the galleries of the College were open for social converse, and on leaving each guest received an enlargement of a snapshot taken at Downe of Master, President, and Benefactor.

MEDICINE AND THE LAW

Drunkenness as a Defence in Criminal Cases

A LEARNED author writes in the current *Law Quarterly Review* a full account of drunkenness as a possible defence to the many criminal charges which contain the ingredient of intention. The law has always stood solidly on the position that voluntary drunkenness is never a defence. A drunkard, declared the great Coke, is *voluntarius dæmon ;* he "hath no privilege thereby" but merely aggravates his wrongdoing. Sir Matthew Hale, another famous authority of the Stuart period, similarly called drunkenness *dementia affectata*, a voluntarily contracted madness, which was no excuse except in two cases—(*a*) where the patient has inadvertently eaten or drunk something by what Hale quaintly calls "the unskilfulness of his physician or the contrivance of his enemies," or (*b*) where "habitual or fixed phrenzy" can be established, as distinct from "simply phrenzy occasioned immediately by drunkenness." In the nineteenth century the decision in R. *v.* Meakin (1836) was instructive. The prisoner stabbed someone with a fork when "something the worse for liquor." The judge said that the use of a deadly weapon so clearly displayed malicious intent that drunkenness could not alter the position. Stephen, J., in R. *v.* Davis (1881) ruled that a man would not be criminally responsible if by drunkenness he brought on a state of disease which caused such a degree of madness even for a time as would have relieved him from responsibility if it had been caused in any other way. The same judge in R. *v.* Doherty (1887) observed that a man intends the natural consequences of his act. Drunkenness was no excuse for crime, but if the crime was such that the intention of the party is a constituent element, "you may look at the fact that a man was in drink in considering whether he formed the intention to commit the crime." A drunken man, said the judge, may form an intention to kill another person, or he may not ; if he does form that intention, although a drunken intention, he is just as much guilty of murder as if he had been sober. Lord Coleridge raised some doubts in R. *v.* Meade (1909) by using the slightly rhetorical phrase "reason dethroned by drink." The leading case is now to be found in Director of Public Prosecutions *v.* Beard (1920), where the accused, charged with rape, had suffocated a girl of 13 by putting his hand on her mouth to stop her screaming. Mr. Justice Bailhache told the jury that, if a man said "I was mad and turned into a brute by drink," it was no defence unless the jury was satisfied that he was so far out of his senses that he did not know what he was doing. The Court of Criminal Appeal thought this was likely to mislead the jury ; it imposed a test of the defence of drunkenness which was applicable only to the defence of

insanity. In the House of Lords Lord Birkenhead observed that Beard's drunkenness could be no defence unless it were established that, at the time of committing the rape, he was incapable of forming the intent to commit it, "which was not in fact contended at the trial." Lord Birkenhead's judgment, though some think it went too far, is at present the locus classicus of the law.

It is interesting to the medico-legal student to observe the legal distinction between drunkenness and insanity. It is even more interesting to note that the author of the *Law Quarterly Review* article can say that if the law were modified and if drunkenness were treated more as a disease, the law would bring moral and legal responsibility into closer harmony. There are inebriates, he concludes, who cannot help being such for reasons of a diseased condition of the brain induced by alcohol either voluntarily or on account of the heritage of a neurotic and unstable brain. "It is but fair that the law should take as much account as it can . . . of the factors that may modify or make impossible full responsibility by fettering or preventing normal volition."

CANADA

(FROM AN OCCASIONAL CORRESPONDENT)

THE PROVINCE OF QUEBEC: VITAL STATISTICS

A REPORT has been issued by the Provincial Bureau of Health of Quebec which shows that in the year ending last July the death-rate in this province was the lowest in its history, falling to 8·7 per 1000 population. In July, 1932, the death-rate of the previous 12 months was 9·9 per 1000, that being the first time that it was below 10. The report points out that the recent figure confirms a progressive tendency which has been observed since 1926, but, as elsewhere, the birth-rate has exhibited a similar decline. During the first seven months of the year under review there were 45,250 births compared with 48,993 in the previous year; the deaths during the corresponding seven months totalled 19,010, as against 19,750 in the previous year. In this province, however, the marriage-rate was falling. There were 1626 marriages in the past July compared with 1537 in July, 1932, while the total for seven months fell from 8361 to 7855. In the city of Montreal during the past July there were 342 live births, 71 marriages, and 174 deaths.

The health of infants and young children in Montreal is far from satisfactory. This can be gathered from a recent report issued by Miss E. Beith, executive director of the Montreal Child Welfare Association. The report shows that a marked increase in attendance at the pre-school health clinics has been observed—which is all to the good, but the health of the subjects is more unsatisfactory than has been known since the clinics of the association were inaugurated. 1200 more children attended these clinics than in the same period a year ago. 1987 children were immunised against diphtheria compared with 575 last year, while the number of interviews devoted to instructing mothers on the care of their babies showed an increase of 600 over last year. It is not that the death-rate of babies under the supervision of the Montreal Child Welfare Association has increased, but physicians and nurses are reporting a general lowering of health among the children under one year of age. Until this autumn, according to the report, this group of children had not shown the decrease in vitality which has been so manifest for some time in the older children and which the framers of the report have no hesitation in attributing to the effects of continued unemployment. It is now found that these infants are definitely under weight and many of them anæmic, responding very badly to treatment; the Child Welfare Association is one of the federated charities of Montreal, and has under its care, for health supervision and instruction, 10,000 Montreal children under school age. Further monetary support is needed.

MENTAL CASES IN CANADA

According to Dr. W. T. Bruce, director of the Mental Hygiene Institute, another of the federated charities, patients in the mental hospitals of Canada have increased from 30,488 in January, 1931, to 32,059 in January, 1932. During 1930 8869 new patients were admitted, and in 1931 10,089 were admitted. It is estimated that the cost of maintaining them in hospital is more than $10,000,000 a year, or $330 annually for each individual. It is also stated that about 50 per cent. of the patients in Canadian mental hospitals "are suffering from no brain or nerve injury and have no physical basis for their affliction." Their mental illness, in the opinion of Dr. Bruce, is the result of inability to reconcile their personal wishes and desires with the demands of society; the resulting lack of harmony within more or less destroys completely any possibility of happiness, and Dr. Bruce pleads earnestly for wider public instruction in the principles of mental disease and affliction.

THE NEUROLOGICAL INSTITUTE IN MONTREAL

A Neurological Institute, as a unit of the medical department of McGill University, is in course of erection in direct connexion with the Royal Victoria Hospital, but also having association with the Montreal General Hospital. When completed, the building will accommodate 30 patients in public, private, or semi-private wards, and there will be operating-rooms, an X ray department, animal rooms, and laboratory space for carrying on pathological and histological work. It is proposed to provide living accommodation for a small group of research fellows. Neurosurgery has been practised at McGill University by Prof. E. W. Archibald hitherto, and many students have benefited by his teaching. It is intended to extend greatly the scope of the work, and with this in view Dr. Wilder Graves Penfield has joined the McGill medical school as the first professor of neurology. Dr. Penfield is a graduate in arts of Princeton University and of medicine in the Johns Hopkins University, and was a Rhodes scholar at Oxford. He has also held a Beit Memorial Research Fellowship. He has been recently neurologist at the Vanderbilt Clinic and associate professor of surgery at Columbia University. He is accompanied to McGill by Dr. W. V. Cone, who has worked with him in New York.

An obstacle to the establishing of a big neurological centre in Montreal was until recently the lack of funds to house and carry on the work in a manner in accordance with the views of those interested, and it is owing largely to the Rockefeller Foundation that success has attended the efforts of those anxious to have in Montreal an institute which will bear comparison with any on the American continent. The Foundation, when approached, concluded that McGill University, with its reputation and environment, offered a proper field for the teaching and practice of neurology and neuro-surgery, and came forward with a gift of $1,232,652, which virtually

set at rest all financial anxieties. The Provincial Government of Quebec promised $20,000 a year, and the city of Montreal $15,000 annually. Of large personal gifts there should be mentioned $100,000 from Sir Herbert Holt, president of the Royal Victoria Hospital, and governor of McGill University; $100,000 from Mr. J. W. McConnell, and $25,000 from Mr. Walter Stewart; both these latter are governors of McGill University and of the Royal Victoria Hospital.

Lord Bessborough, the Governor-General of Canada, has now laid the foundation-stone of the Institute, and Dr. C. F. Martin, Dean of the Faculty of Medicine, has recorded in the *McGill University News* the story of the new institution, wherein he gives a large share of credit for the consummation of the scheme to Prof. Archibald.

IRELAND

(FROM OUR OWN CORRESPONDENT)

THE POPULATION OF THE FREE STATE

THE report of the Registrar-General of the Irish Free State for 1932 was issued last week. The population was estimated as 2,974,000, showing an increase of 17,000 over the previous year. The actual number of deaths was greater than in 1931, but the death-rate was lower—namely, 14·45 per 1000, whereas in 1931 it was 14·52. The number of births (56,240) was the lowest ever recorded, the rate being 18·91 per 1000. The rate for the ten years 1922–31 was 20·17, and in 1931 the rate was 19·30. The number of illegitimate births was 3·23 per cent. of the total births. In Northern Ireland the percentage was 5·1, in England and Wales 4·4, and in Scotland 7·1. The infant mortality showed a rise, the rate being 72 per 1000 births, against 69 in 1931 and 70 in 1922–31. There is a great disparity between the rate of 95 in urban areas and 59 in rural. Among legitimate children the death-rate was 67 per 1000; among illegitimate it was 240. Emigration has declined to such an extent that it is now overbalanced by immigration, and the natural increase of births over deaths is, for the first time for 85 years, showing its effect on the population.

THE POISONS BOARD

Sir Gerald Bellhouse has been appointed chairman of the Poisons Board established under Section 16 of the Pharmacy and Poisons Act, 1933. The other members of the Board are:

	Appointed by
Sir Walter Greaves-Lord, K.C., M.P.; Sir William George Lobjoit, J.P.; Mr. M. H. Whitelegge	Home Secretary.
Mr. J. M. Johnston, F.R.C.S. Edin.	Secretary of State for Scotland.
Mr. J. N. Beckett; Dr. G. F. McCleary	Minister of Health.
Mr. H. E. Dale	Minister of Agriculture and Fisheries.
Sir Robert Robertson, F.R.S. (or deputy)	Ex officio as Government Chemist.
Mr. J. H. Franklin; Mr. H. N. Linstead; Mr. G. A. Mallinson; Mr. E. T. Neathercoat, J.P.; Mr. P. Sparks	Pharmaceutical Society of Great Britain.
Sir William Willcox, M.D.	Royal College of Physicians of London.
Dr. R. Stockman, LL.D.	Royal College of Physicians of Edinburgh.
Dr. S. A. Smith, D.P.H.	General Medical Council.
Dr. G. Roche Lynch, F.I.C.	Council of the Institute of Chemistry of Great Britain and Ireland.
Dr. J. W. Bone	British Medical Association.

The duties of the Board are to prepare for the approval of the Home Secretary a list of the substances which are to be treated as poisons for the purposes of the Act, and generally to advise him in regard to the rules to be made for the control of poisons.

PUBLIC HEALTH SERVICES

Dysentery and Typhoid in Mental Institutions

WHILE there has been no more striking evidence of the benefits of modern sanitation than the decline in those forms of acute communicable disease which are contracted by the alimentary route, recent occurrences, especially in Yorkshire and Lancashire, have shown that persistent sanitary defects or loop-holes in administration may still lead to serious outbreaks of dysentery or the enteric fevers. Such epidemics, however, may be regarded as exceptional and, in a sense, accidental. Improvement in the personal habits of the people has, no doubt, been an important factor influencing the decline of these diseases among the general population, and now, except where there has been gross contamination of water or some article of food, the danger is greatest among those, such as children, who can least be expected to exercise sanitary care. For a like reason, a large group of persons among whom such infections are still common is to be found in the population of mental hospitals. Dysentery and the enterics continue, unfortunately, to be a cause of anxiety to the Board of Control and to the medical superintendents of several mental hospitals. It is not surprising, therefore, that the supplement to the Board's annual report [1] for 1932 on scientific research work, and the reports of visiting committees should contain repeated references to this problem.

In some hospitals examination of fæces and blood for the detection of cases or carriers represents a large part of the total volume of laboratory work. Indeed, it is almost possible, from a glance at the summary of laboratory examinations, to judge whether an institution has recently experienced, or is still experiencing, intestinal infections in endemic or epidemic form. Several institutions are not only practising the most careful scrutiny of all inmates showing the least suspicion of infection with the typhoid-dysentery group of micro-organisms, but are also making, as a matter of routine, bacteriological and serological examinations of all new patients. As a result, the practical control of the diseases in question, on a scientific basis, is within reach. Valuable observations, too, are being made, and some conclusions of general interest are emerging. For instance, Dr. P. W. Bedford, medical superintendent of Dorset mental hospital, concludes from a search for dysentery carriers that:—

(*a*) Dysentery is rarely brought into the hospital from an outside source.

(*b*) Agglutination reactions of blood do not discriminate carriers.

(*c*) Case-records of "dysentery and diarrhœa" not supported by bacteriological examination are of little value and may be misleading.

[1] Nineteenth Annual Report of the Board of Control for 1932. Part II. H.M. Stationery Office. 1933. Pp. 178. 3*s*.

(*d*) The excretion of *B. dysent.* Flexner in stools of known carriers is markedly intermittent and serial specimens of fæces must be strictly consecutive.

(*e*) A true carrier, who has never shown symptoms of the disease, must for ever be considered suspect, despite repeated negative results.

Similarly, Dr. H. Stafford, of the Cheshire hospital at Macclesfield, from his studies of the fæces and blood of cases with a known history, decides that "examination of sera for agglutinins to Flexner's organisms is not likely to prove of much assistance in any search for dysentery carriers."

Examinations of fæces, therefore, must be depended upon for the discovery of potential centres of infection. In this connexion at the West Riding mental hospital, Wakefield, Prof. Shaw Bolton failed to find organisms of the typhoid-dysentery group in specimens from any new admissions during the year, an experience which supports Dr. Bedford's conclusion, quoted above, that dysentery is rarely introduced from without.

The type of dysentery appears to be fairly constant in any one institution, although various types prevail in different places.

At the West Riding hospital, Wadsley, agglutinable Flexner WY was isolated in 35 of 47 cases, in another case the same type was present in non-agglutinable form, and in 8 others it was assumed to be the cause from diagnostic Widal tests. From the remaining 3 cases *B. dysenteriæ* Sonne was isolated. At the not very remote sister hospital at Wakefield, among 8 new cases Flexner Z occurred in 6 and Flexner V in 2. Of 38 cases in the Leicester City mental hospital, 21 were due to Flexner Z, 11 to Flexner Y, and 6 to *B. dysenteriæ* Sonne.

In addition to the careful search for carriers and their isolation which is proceeding, active prophylaxis is being employed. At the Bristol City mental hospital 271 new admissions during the year received prophylactic vaccines, and it is recorded that only one case of dysentery occurred due to a *B. dysenteriæ* Flexner WX strain. At the Stafford county hospital, Cheddleton, almost the whole hospital population has been inoculated with a sensitised anti-dysentery vaccine, without any severe reactions, doses of a mixed Flexner W, X, Y, and Z vaccine being given up to 4000 millions. Dr. W. F. Menzies, the medical superintendent, remarks that it would be premature to judge of the efficacy of this form of prophylaxis by a recent outbreak of dysentery. At Caterham (London Co.) mental hospital, where Flexner Z is the prevailing strain, all occupants of infected wards are now immunised with a vaccine prepared from indigenous cases, the dosage being 250 and 500 million organisms. Altogether, 322 patients have been inoculated. Here delay in the treatment of a ward was signalised by the occurrence of three secondary cases in rapid succession.

ENTERIC FEVERS

While the enteric fevers do not constitute such a constant problem as dysentery, there is ample evidence that their liability to sporadic outbreak is a matter of concern. At the West Riding hospital, Wadsley, where organisms of the typhoid-dysentery group have not been found in any newly admitted patient, nevertheless five known typhoid carriers are under isolation, and two fresh cases of the disease occurred during the year. One of the carriers had suffered from the disease in 1926, and after weekly fæcal examinations for three months was regarded as free from infection. She contracted dysentery (Flexner V) in 1929, and went through a similar period of bacteriological scrutiny thereafter without, apparently, the detection of any typhoid bacilli, and it was not till 1932, when a search for dysentery carriers was being made, that she was discovered to be excreting the typhoid bacillus intermittently and in small numbers.

The rôle of the gall-bladder in the typhoid carrier state receives some prominence in the reports. At Dorset mental hospital, Dr. Bedford is carrying out a post-mortem bacteriological examination of all gall-bladders, but so far has failed to isolate any of the typhoid group from cases not known to be carriers during life. At Leavesden (London Co.) mental hospital, now an institution for mental defectives, it was decided to carry out cholecystectomy in suitable cases and, accordingly, the operation was performed upon three male and four female patients. Two died of cardiac or pulmonary post-operative complications, but the carrier state was successfully abolished in the other five.

An investigation of much general interest has been carried out by Dr. G. W. Fleming, at the Hereford mental hospital. Following the method of Wilson and Blair and using their liquid enrichment medium, Dr. Fleming has succeeded in isolating *B. typhosus* or *paratyphosus* B four times in 14 successive examinations of the institutional sewage over a period of less than three months. During the same period carriers were being sought and isolated, but three-fifths of the institutional population remained to be dealt with. The importance of these findings in relation to the disposal of institutional sewage requires no emphasis.

Salmonella infections, although not admitted to be associated with bacterial carriers, have received attention in the East Sussex hospital, where 148 new admissions have been submitted to agglutination tests by Dr. A. G. Shera. Thirteen, or 8·74 per cent., showed degrees of agglutination considered significant of recent or remote infection, varying from 1/25 to 1/250. Only two, however, were in dilutions as high as 1/50 and one in 1/250. In this connexion the records of Monyhull colony for mental defectives are of special interest. Here, under the coördinating influence of Dr. F. A. Pickworth, of the Birmingham Joint Board of Mental Research, serological examinations of a comprehensive character have been made of all admissions and transfers over a period of three years. Agglutinations, regarded as positive, have been obtained to Flexner Y, Shiga, Sonne, paratyphoid B, and different strains of salmonella, singly or in various combinations, in 188 or 52·2 per cent. of 360 cases examined. It is noted that none of the 360 cases had suffered from any form of intestinal disease when under care, nor was any positive history obtained of an attack prior to admission.

The very thorough search for centres of infection, thus seen to be almost the rule in modern mental hospitals, should go far to remove the reproach of endemic intestinal disease from their administration. While the underlying biological phenomena are no less complex than might have been expected, their gradual illumination will no doubt bring home to visiting committees the importance of giving the institutional staffs adequate facilities for controlling infection. The principles are simple enough, though the conditions peculiar to mental disease and deficiency render them difficult of application. It may be noted that quarantine and isolation accommodation of a modern type are sadly lacking in many institutions of this kind.

Diphtheria Control in Australia

In Port Pirie, a township of 12,000 inhabitants in South Australia, 80 cases of diphtheria occurred between April and October, 1932—more than half of

them before the end of June. It was realised that ordinary preventive measures were proving ineffective and it was decided, therefore, to offer active immunisation. Dr. C. S. Barbour gives an interesting account[1] of what was done. The response to leaflets was very good, and in one way or another consent was obtained in respect of 633 of 977 scholars (65 per cent.) and, in addition, nearly 100 per cent. of contacts. Barbour contrasts this response with that obtained in inter-epidemic periods, when 25 per cent. of volunteers was considered high. The Schick test was carried out on school-children and on contacts over five years of age, contacts under five being immunised without a preliminary test. The control of the Schick test was always omitted. Since it seems that readings were taken late enough to eliminate the possibility of confusing a pseudo-reaction, and skin sensitivity (Moloney) tests were always done, this omission could not mislead and saved a good deal of time. Anatoxin prepared by the Commonwealth Serum Laboratories was the prophylactic used. Before immunisation 0·1 c.cm. of a 1 in 20 dilution of anatoxin was injected intradermally and readings of this sensitivity test were made upon the second day. If no reaction occurred, as was usual in young children, full doses of anatoxin (viz., two of 0·5 c.cm. and a final dose of 1·0 c.cm.) were injected at three-weekly intervals. Those showing a skin reaction, with or without induration, up to a diameter of 1·25 cm. received doses varying from 0·1 to 0·4 c.cm. Those developing reactions of greater diameter never received doses exceeding 0·01 c.cm. There were only four severe sensitivity reactions; three in adults and one in a girl 10 years of age. Two of these reactors were injected with 0·01 c.cm. of anatoxin and developed only slight local tenderness quite disproportionate to the skin reaction. Only one person experienced a general reaction after either the skin tests or prophylactic injections, and this was limited to transient dizziness and headache, symptoms which were repeated after each minimal immunising dose. Only once was a negative skin test followed by a fairly severe local reaction after a prophylactic dose. Of the total immunised, 68 were submitted to a confirmatory Schick test and it was found that 90 per cent. of those who had received the full course had become negative reactors and in the remaining 10 per cent. the test was only faintly positive.

In the same journal (p. 366) Dr. M. J. Holmes, of Canberra, relates the results of swabbings and virulence tests in an exposed group of 53 children of from five to seven years of age in a kindergarten and a non-exposed group (during an inter-epidemic period) of 25 children under the age of five years. In the first group 15 children from as many families returned morphologically positive swabs. In 6 instances the organisms were found to be virulent (12 per cent. of the class). In the non-exposed group 6 children were harbouring morphological diphtheria bacilli but in every case they were found to be avirulent. Holmes emphasises the necessity of following up swabbing by virulence tests. The percentage of Schick-negative reactors amongst those carrying virulent organisms was 67 per cent. and amongst carriers of non-toxic strains 37 per cent. No instance of clinical diphtheria occurred amongst positive reactors who were harbouring virulent organisms and Holmes thinks that if the infecting dose, although virulent, is small, a child although apparently susceptible may be able to acquire immunity "in time to forestall the development of the disease." It is, of course, now well recognised that a small virulent infection occurring in a child possessing basal immunity, although at the time Schick-positive, acts as a secondary stimulus and may rapidly raise the antitoxic content of the blood to at least Schick-negative level.

[1] Med. Jour. Australia, Sept. 16th, p. 363.

Enforcement of Food Standards

In a Chadwick lecture delivered at Reading on Nov. 14th Mr. E. G. Haygarth Brown, late of the Ministry of Agriculture, pointed out that as all foods are already standardised as far as possible in respect of injurious ingredients, and also for preservatives and colouring matter, any further standards must be of the kind that define the ingredients, other than injurious ingredients and preservatives, of which foods sold under certain names should consist. Of standards of this kind he mentioned a number already existing, but said that there were many articles of food for which standards might be and perhaps ought to be set up. The question was how to make the standard operative. There were objections to the multiplication of crimes, and retailers would, he thought, oppose further legislation of the kind known as quasi-criminal, under which a seller might be punished for selling a food not up to standard even though it was in a sealed tin or bottle, so that it was clear that he did not know and could not, in practice, have ascertained that it was defective. Such legislation was contrary to common sense; legal punishment was only useful as a deterrent, and if there was no intention to commit an offence there was nothing to counteract. On the other hand, many people thought that the imposition of civil liability only on the seller would not be effective. His own view was that civil liability does now exercise a fairly effective control over trade practice, and would do the same in the case of any new standards that might be set up.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 4TH, 1933

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 1 (last week 4); scarlet fever, 3996; diphtheria, 1282; enteric fever, 32; acute pneumonia (primary or influenzal), 824; puerperal fever, 38; puerperal pyrexia, 88; cerebro-spinal fever, 13; acute poliomyelitis, 13; encephalitis lethargica, 8; dysentery, 17; ophthalmia neonatorum, 67. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Nov. 7th–8th was as follows: Small-pox, 3; scarlet fever, 3253; diphtheria, 2025; enteric fever, 26; measles, 369; whooping-cough, 120; puerperal fever, 24 mothers (plus 6 babies); encephalitis lethargica, 254; poliomyelitis, 6; "other diseases," 159. At St. Margaret's Hospital there were 14 babies (plus 4 mothers) with ophthalmia neonatorum.

Deaths.—In 118 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 8 (2) from measles, 9 (1) from scarlet fever, 15 (5) from whooping-cough, 33 (13) from diphtheria, 76 (27) from diarrhœa and enteritis under two years, and 34 (4) from influenza. The figures in parentheses are those for London itself.

Of the deaths from diarrhœa, 6 occurred at Manchester, 5 at Liverpool, 4 each at Sunderland and Birmingham, 3 at Hull. Barrow-in-Furness reported the only death from enteric fever. Three deaths at Doncaster were attributed to influenza.

The number of stillbirths notified during the week was 218 (corresponding to a rate of 37 per 1000 total births), including 28 in London.

CORRESPONDENCE

FLUCTUATIONS IN BLOOD COUNTS

To the Editor of THE LANCET

SIR,—In the annotation upon this subject in your last issue you appear to me to assume that the action of X rays and radium upon the formed elements of the blood is similar. This I understand to be a widespread belief, and I believe it to be erroneous. Of the damaging effects of radium there can be no question, but I have never met any evidence that exposure to X rays either by concentrated doses, as in deep X ray therapy, or by constant exposure, as in the case of X ray workers, produced any change in either the red cell or white cell count. I have examined numerous patients who have been exposed to deep radiation for cancer, and for many years we have at the London Hospital made periodical examinations of the blood of the X ray workers. Not a single instance of any appreciable effect upon either the red cells or the white cells has been observed. Further, I have seen numerous examples of severe anæmia in radium workers and still more examples of the early leucopenia with a relative lymphocytosis which one regards as a serious warning, and I have never seen these changes in any radiologist concerned *only* with the application of X rays. Theoretically, damage to the blood or bone-marrow by the action of X rays is of course possible, but in practice this risk affects the radium and not the X ray worker.

The fluctuations of the normal leucocyte count are no doubt with the usual technique considerable and with any technique appreciable, but fluctuations of the order described by Dr. Simpson seem to me almost incredible. A careful total and differential white cell count remains a valuable aid to diagnosis. If the normal fluctuations were not reasonably near the high standard noted by Prof. Eric Ponder we should not now be making 20 or 30 white cell counts a day at the London Hospital.

I am, Sir, yours faithfully,

London Hospital, Nov. 13th, 1933. P. N. PANTON.

To the Editor of THE LANCET

SIR,—The fact that the white cell count of the blood may show wide variations in normal individuals is well recognised by clinical pathologists. I hesitate to make any claim to the laying down of dogma, but would like to point out that in the article on the interpretation of the blood count, appearing in the Clinical Interpretation of Aids to Diagnosis (1930), I wrote, "there is no fixed normal figure for the total number of white cells in the circulating blood. Their numbers are subject to physiological variations depending upon exercise, upon the state of digestion, and even fluctuate throughout the day without apparent reference to any particular cause." This fact I believe to be well recognised among my fellow clinical pathologists.

I am, Sir, yours faithfully,

Wolverhampton, Nov. 11th, 1933. S. C. DYKE.

To the Editor of THE LANCET

SIR,—Your annotation correlating the hæmatological report of the X Ray and Radium Protection Committee with the tenth annual report of the British Empire Cancer Campaign has given further publicity to the large fluctuations in leucocytes which Dr. R. H. Simpson has described as occurring with great rapidity even under normal conditions. The fluctuations described are of such an order that, as you rightly emphasise, a serious doubt is cast on the value of a simple leucocyte count as ordinarily performed—a procedure which for years has had an important and valued place in practical medicine. Excluding gross and obvious leucocytic fluctuations, which are pathological and cannot be disputed, the significance of smaller ones appears to me to rest not so much on magnitude as on the range of figures between which the fluctuations occur. Thus if the extreme limits of a normal leucocyte count be fixed as 5000 and 10,000 per c.mm., then practically no significance attaches to fluctuations between these two figures. A person having a count of 9000 on one day, or, at a particular hour or minute, and a count of 6000 on another day, or, at another hour or minute, is not exhibiting a pathological fluctuation; but a person with a count of 5000 which falls to 3500, approximately the same 33 per cent. fall, is exhibiting a significant leucopenia requiring explanation; the same interpretation should be applied to leucocytic increases over 10,000. It is true that the explanation of these changes may not always be evident either on clinical or any other grounds, but where an X ray or radium worker exhibits a leucopenia, with a cell count of 4500 or less, the explanation should, for safety, be assumed to be the occupation. If it is accepted that variations between 5000 and 10,000 are insignificant then, included therein, will be most of the variations due to an afternoon tide, to digestion, and to other physiological factors. And if a fluctuation of ± 10 per cent. (8 per cent. according to Ponder) be regarded as allowing for the insignificant changes outside the normal range of 5000–10,000, then the diagnostic value of the leucocyte count remains, for interpretation purposes, on the firm basis which it has always occupied. Clinical pathologists in general have never attached great importance to fluctuations within the normal limits described above and an examination of the charts published on pp. 53–55 of the tenth annual report of the British Empire Cancer Campaign shows that nearly all the fluctuations described there lie within these normal limits.

In my own experience I have never met with a leucocyte count, outside the limits of 5000–10,000, in which a twofold increase or decrease, much more a fourfold, has not had considerable pathological significance and this irrespective of such details as time of day. I am sure that this experience must be the usual one's otherwise the leucocyte count would long ago have joined the limbo of discarded and discredited practices.

With regard to X ray and radium workers as distinct from patients undergoing treatment, the conclusions to be drawn from an analysis of the routine examinations at the Middlesex Hospital agree with the "Recommendations" of the X Ray and Radium Protection Committee's report, namely, that a sustained leucopenia or lymphopenia (4500 cells or less in my opinion to be regarded as leucopenia) is a sign which cannot safely be disregarded. With such patients, where one looks for small significant leucocytic variations, which if found must be confirmed by daily observations, the technique must be beyond question and attention be paid to time of day, relation to meals, menses, and other factors. But for the ordinary simple leucocyte count of the medical and surgical ward the time of day, &c., is usually immaterial.

From the aspect of practical medicine it is obviously essential that significant fluctuations in a leucocyte

count should not lightly be disregarded unless overwhelming evidence is produced to show that normal fluctuations regularly pass outside the limits defined above. I am, Sir, yours faithfully,

L. E. H. WHITBY.

Middlesex Hospital, W., Nov. 14th, 1933.

THE LATE PROF. EMILE ROUX

To the Editor of THE LANCET

SIR,—As one of those who, in 1890, attended Roux's famous course of bacteriology at the Pasteur Institute—to which allusion is made in the obituary notice in THE LANCET of Nov. 11th—I should like to refer to his remarkable powers as a teacher. Although so many years have passed since then I still retain a vivid recollection of his lectures. They were delivered in fluent and lucid French, easy to follow even by those whose knowledge of the language was limited. On one occasion he lectured continuously for two hours on rabies, holding his audience spellbound by his eloquence while he described the means by which Pasteur and he had worked out and established the methods of making the antirabic inoculations and gave convincing proofs of their success. Ten years, he said, had been devoted to this investigation and perhaps his share in Pasteur's great work has scarcely received the recognition it deserves. As rabies has for long ceased to exist in this country the importance of their work can hardly be realised. I have only seen one case of rabies in this country 45 years ago, but that was sufficient to enable me to realise the enormous value of antirabic inoculations in countries where the malady still persists. Roux's teaching and example inspired hundreds of workers. His insistence on accuracy and attention to every detail in his practical class, and his scathing remarks about any mistake or carelessness, were a valuable training in scientific method.

I am, Sir, yours faithfully,

Manchester, Nov. 13th, 1933. GEORGE R. MURRAY.

A CHRISTMAS APPEAL

To the Editor of THE LANCET

SIR,—For many years you have kindly allowed me to appeal through your columns for the Christmas Gift Fund of the Royal Medical Benevolent Fund. It is natural, as the existence and the usefulness of this benevolent fund become more widely known, that the number of our beneficiaries should steadily increase each year. During 1932 the fund was assisting over 650 beneficiaries and it has been our custom to give a Christmas gift to all the annuitants and to the poorest of the grantees.

I feel it is a great responsibility that none shall be disappointed this year. I ask, Sir, for your approval and support of my appeal. I am confident that it will be the wish of many that our beneficiaries who are either infirm or invalid doctors, widows or daughters of deceased medical men whose total incomes are not even £100 a year, may be given again this Christmas a gift of 30*s.* each.

Such a gift is not a luxury when the recipients are pressed for the necessities of life. It can but give some warmth or clothing to many who dread the winter months. Donations may be sent to the hon. treasurer, Royal Medical Benevolent Fund, 11, Chandos-street, W.1. Every contribution will be distributed without deduction of expenses.

I am, Sir, yours faithfully,

THOS. BARLOW,
President of the Royal Medical Benevolent Fund.

Nov. 10th, 1933.

TUBERCULOSIS AMONG THE NORTH AMERICAN INDIANS

To the Editor of THE LANCET

SIR,—In an annotation in your issue of Sept. 23rd (p. 715) occurs the following statement: "The problem of tuberculosis among Red Indians has ceased to be one of any importance, for that noble race is almost extinct. Civilisation offered a poor exchange when the first of the gunmen replaced the last of the Mohicans." This statement is not in accordance with the facts, for the North American Indian is not dying out, nor is he showing any decided inclination in this direction. According to the census of 1930 the number of Indians in this country is 332, 397 against an enumerated Indian population of 237,196 in 1900. As the result of an enlightened policy increased appropriations and constant attention to the subject, the tuberculosis death-rate of our North American Indians seems to have been successfully arrested. The medical service for our Indians has been decidedly improved, and now gives on the whole reasonable satisfaction to a widely scattered population. Certain small tribes are unquestionably dying out, but the more predominating tribes, such as the Sioux, Chippewas and Navajos, are showing marked increases over previous years. This is particularly so of the Navajo, which is the finest type of surviving Indians in this country. They inhabit a vast reservation under practically ideal conditions of Indian life. A full report of Indians by tribes is in course of publication by the United States Census Office, but this will not be available for some time to come.

The tuberculosis problem as it affects our Indian population remains, however, of outstanding importance. In 1930, out of 5384 deaths from all causes among our Indians, the number of deaths from all forms of tuberculosis was 1175 or about 22 per cent. Among the Indians of British Columbia, in 1931 there were 512 deaths from all causes, of which 165 were from all forms of tuberculosis, or about 32 per cent. In British Columbia the death-rate from all forms of tuberculosis was 657 per 100,000 in 1931, a marked increase over the rate for 1922 which was 385. This compares with a rate of 189 for the Chinese of British Columbia, and 171 for the Japanese. I regret I cannot give the precise rates for this country since the Indian population of the registration area is not yet available, but it is probably safe to assume that it is not very much in excess of 300 per 100,000—which, of course, is still extremely high. Under our present medical policy in the Bureau of Indian Affairs, a marked reduction in the tuberculosis mortality can be anticipated in the near future. We are providing better housing facilities and better provision for sanatoria, while much is being done also to improve the nutritional condition of the Indian population.

I am, Sir, yours faithfully,

F. L. HOFFMAN.

Wellesley Hills, Massachusetts, Oct. 21st, 1933.

VACCINES IN AMPOULES

To the Editor of THE LANCET

SIR,—May I call attention to the great inconvenience caused to practitioners by the custom of sending out vaccines in many coloured ampoules containing a series of doses determined without any knowledge of the needs of the individual patient. Sometimes a patient will come, with a box of these ampoules, asking that a course already commenced may be continued,

and mentioning that her previous doctor says that the next dose should be half a violet ampoule. One has either to disparage the previous doctor by casting doubt on the ampoule method of treatment or else vainly endeavour to regulate dosage within the narrow limits which the ampoule system allows. I have now on my desk a box of ampoules with a letter from the pathologist pointing out in most courteous terms how I ought to use them. This was sent at the request of a specialist who had operated on the patient, but a bill was included made out to me personally. I much prefer to decide for myself how to administer a vaccine and I do not think pathologists should any longer assume that the practitioner is necessarily incapable of making such decisions, for they have at least the not inconsiderable advantage of seeing the patient under treatment. In this particular case the specialist did his work so well that the vaccine is not needed at all. All of which makes things very difficult, especially for the pathologist, for I really cannot see who is to pay his bill.

Perhaps some appropriate society would see fit to consider this subject. It would be a great gain if the public began to appreciate the fact that two or three routine doses of an anti-catarrh vaccine, or of an anti-typhoid vaccine, do not represent more than the roughest approximation to scientific usage.

I am, Sir, yours faithfully,

Sevenoaks, Kent, Nov. 12th, 1933. GORDON WARD.

CARBOHYDRATE METABOLISM IN HYPERTHYROIDISM

To the Editor of THE LANCET

SIR,—I am grateful to Dr. Lawrence for his interesting and valuable information in regard to depletion of heart glycogen in thyrotoxicosis—a further support for a marked carbohydrate bias in the diet of such cases. My remarks on the use of insulin were intended to apply to cases of maintained hyperglycæmia. I agree with Dr. Moll that it is not, as a rule, required. I trust I made it clear that my own use of carbohydrate in thyrotoxicosis was suggested by his article.

I am, Sir, yours faithfully,

Manchester, Nov. 10th, 1933. NORMAN KLETZ.

POLICE-COURT PUBLICITY

To the Editor of THE LANCET

SIR,—May I draw your urgent attention to the current and general practice of the popular press in publishing, often with startling and suggestive headlines, police-court proceedings against doctors—usually for Road Traffic Act infringements—before the case has been fully heard and the doctor's defence made available?

The police recently issued a summons against me on two charges of dangerous driving, together with technical Road Traffic Act infringements of the kind which almost every motorist has to meet sometime. Part of the police case was heard before the magistrate and the remainder, with my own entire defence, was reserved for the sessions. To one's consternation, the more sensational parts of the police charges, and of the magistrate's impromptu comments upon hearing them, were broadcast by the press, before either the police case was completed or my counsel or myself had uttered a word of defence or explanation—or had called a witness.

The mere fact of a charge or summons is a serious matter for a medical man and procedure whereby the charges and the police case (or the more sensational parts of it!) can be published before the doctor's defence is heard, the penalty decided or the case dismissed, is surely a travesty of justice. Cannot our profession, through either the Medical Committee at the House of Commons or the Minister of Health, obtain legislation analogous to that restricting the publication of details of divorce court proceedings? Such legislation would prevent the publication of details of police-court proceedings against doctors, at least until the hearing had been completed. Police-court publicity falls more heavily upon doctors than upon any other class; and, since, by common justice, no penalty should be imposed until the case is proved, surely the publicity—usually, for a doctor, the most severe part of the penalty—should be delayed, if necessary by law, until the penalty itself has been decided.

I am, Sir, yours faithfully,

London, W., Nov. 13th, 1933. JOHN GODSALL.

DIVERTICULA OF THE DUODENUM

To the Editor of THE LANCET

SIR,—Your comment on the rarity of duodenal diverticula in last week's issue of THE LANCET (p. 1100) prompts me to quote figures showing the incidence of the condition as revealed by routine X ray examination of the alimentary tract at King's College Hospital. During the seven-year period, 1925–1931, diverticula of the duodenum were found in 31 of 4631 examinations, an incidence of 0·7 per cent. This estimate is, however, too low, as the figures for each individual year show. These are as follows:—

Year.	X rays.	Cases.	Percentage.
1925	521	1	0·2
1926	580	1	0·2
1927	630	1	0·2
1928	653	6	0·9
1929	612	9	1·5
1930	781	7	0·9
1931	854	6	0·7

It will be noticed that the percentage incidence jumped between the years 1927 and 1928 from 0·2 to 0·9 per cent., which figure has been maintained in the succeeding years. This jump in incidence coincides with a remodelling of the technique employed in the routine examination, the chief added feature being the screening of all cases in the oblique position. With further improvements in the technique, the figures show a corresponding rise. For the first eight months of this year, 10 cases have been found in 547 examinations, an incidence of 1·8 per cent.

At the present day, radiology is the most reliable source of figures relating to incidence; operation statistics are of little value, as diverticula of the second and third parts of the duodenum are hidden by the pancreas. This applies with an almost equal force to post-mortem figures, for the diverticula will readily be missed at autopsy unless a definite search is made for them.

I am, Sir, yours faithfully,

London, W., Nov. 13th, 1933. HAROLD EDWARDS.

HEARTENING EXPERIENCE OF A POST-GRADUATE

To the Editor of THE LANCET

SIR,—All Englishmen—or better still, I should say all Britishers—hate sentiment, and wearing their hearts on their sleeves. But there are occasions when necessity compels one to do justice to the kindness and generosity of these much-misunderstood peoples. My experience is a case in point. For purposes of health I made a voyage to England from New Zealand, where I am in practice, and I thought I would take the opportunity of doing some post-graduate work. I had not been to London since the war, and it was

with fear and trepidation that I contemplated this issue, feeling that I would be out of touch with my contemporaries and like a stranger in a strange land. My experience has been the exact opposite, and I cannot speak too highly of the help, consideration, and kindnesses which have been showered on me by those members of our profession with whom it has been my good fortune to come in contact. Had I arrived with the highest letters of commendation and been lauded up to the skies I could not have had more consideration shown to me.

My object in writing this letter is to say to those colonials who are hesitating to come over to take a post-graduate course owing to fear of isolation and being out of touch—"Come!—you will never regret it." I sincerely trust I am not out of place in making especial reference to one of the senior surgeons of the Prince of Wales's Hospital, and also to one of the L.C.C. Whitechapel Clinic staff who have not only been kindness personified, but in the case of the former has been "guide, philosopher, and friend," though I knew them not till meeting them at their respective clinics.

I return home soon with heartfelt gratitude and visions of—who knows?—perhaps another equally pleasant visit in the future.

I am, Sir, yours faithfully,

HUGHES STEELE, M.R.C.S. Eng.

Nov. 8th, 1933. (Wellington, N.Z.)

PANEL AND CONTRACT PRACTICE

Panel and Insurance Committees in Conference

At the adjourned conference between the London panel and insurance committee at the County Hall on Nov. 9th, under the chairmanship of Mr. Shildkraut, discussion was resumed on the control of sickness expenditure. The approved societies pointed out that the bulk of the claims were for short periods; 60 per cent. of unlinked claims—i.e., those in which there had been no previous claim within 12 months—declared off in three weeks or less. In the old days when it took some time for reports to come through this often made reference to R.M.O.'s useless, but now that a report came through in about five days such reference did tend to cut down the claims. An appeal was made to doctors to make use of the space on the certificate "you should come and see me again on....."; at present 40 per cent. of claims terminated on a Saturday. The medical reply was to the effect that Saturday was a real difficulty; patients wanted to start work at the beginning of the week, and would sign off on Saturday if possible.

The medical side initiated a discussion on the medical certificate rules. They should be simplified. Friendly societies in the old days were careful not to overload the shoulders of the unpaid secretary, but the present book of forms with rules was like the Lord's Prayer on a threepenny piece. Neither doctor nor patient ever read them. Some of them were absurd—e.g., that relating to 28 days continuous illness before convalescent home treatment could be ordered. The approved society reply was that rules were printed for the convenience of the doctor. The present form had evolved as a result of difficulties that had arisen in the interpretation of simpler forms; by simplifying a form a certain degree of precision was sacrificed. The medical side had not suggested simplification except in one particular where it was agreed that some flexibility should be allowed. Many doctors did ignore the 28 days' rule, but convalescent home treatment tended to grow on patients, and it was not desirable to encourage the tendency; even now patients were apt to reapply year by year.

The question of reference to R.M.O.'s then came up. The complaint of the doctor is that apparently without rhyme or reason, after doing all he can possibly do for him, the patient is referred by the society without any notice whatever. There was no suggestion that the medical officers did not do their work well or that the patients were not well treated; but the doctor felt slighted. The profession would like to know on what grounds their certificates were doubted. Was sufficient care exercised in selecting cases for reference? The society reply was that whatever might have been the case in the past the utmost care was to-day being taken in the selection of cases. Every detail was considered by a special reviewer or examiner of claims, including the history of the case from date of entry, the contributions paid, current illness, the sick visitor's report, &c. Only a few cases, suspected of not playing the game, were sent early without a sick visitor's report. A test of these early cases had recently been made over a period of seven months: of 2674 claims thus referred 63 per cent. ceased to draw benefit. Such figures were bound to encourage societies to go on referring cases, especially as the percentage did not decrease with the increased number of references. The medical reply to this was that the doctor had to consider the health of the patient rather than the sickness benefit to which he was entitled. Adequate treatment of tonsillitis, for instance, might prevent in later years severe incapacity from rheumatoid arthritis. Agents did encourage insured persons, who had only a limited time left in which to make claims—e.g., those in Class K—to get what they could out of it in the time that remained. What was wanted was closer coöperation between societies and insurance doctors. Some societies did communicate with the doctor about a patient before sending for reference. On the medical side it was pointed out too that about one-third of all referred persons failed to attend either because they had been signed off before the notice came, or because they would have been signed off in a day or so, or through diffidence and indignation at their good faith being doubted. A suggestion was made that some simple form might be agreed upon for societies to send to doctors in the first instance. From the medical side were advanced a few further items in their dislike of reference. Some practitioners did not consider that the R.M.O.'s had consultant status. Some did not initiate references because they were afraid the patient would discover that the doctor had referred him. One society representative said that reference often revealed what was the matter with a patient, even when there was no question of the incapacity; the diagnosis was cleared up.

The last subject discussed was sick visiting. If visitors acted up to the rules set out in the handbook by one of the societies the doctors would have no complaint; but the impression created was that societies were on the look-out for malingerers. The type of visitor employed was not always a happy one; with rather better education and a little more tact things would go more smoothly. They had been known to suggest change of treatment, change of doctor, removal to hospital. Sick visitors should not be allowed to remove dressings. Incapacitated

women should be allowed to do little jobs about the home, such as getting children ready for school, without being reported. The societies in reply said that care was exercised in the selection of sick visitors, but they were human and were often placed in positions of great difficulty. The sick visitor's call often acted as a deterrent from indiscretion—e.g., visiting a cinema. Complaints were few in comparison with the number of visits paid.

The conference before disbanding decided to appoint an ad-hoc committee to work out in more detail the salient points of argument and compromise —four members of the panel and four of the insurance committee.

Urgent Prescriptions

The *Chemist and Druggist* has taken us to task for complaining of the dispensing service provided after hours in most areas. Maybe the conditions are not so unfavourable in small towns where the chemist himself, as well as his dwelling, is known to most of the inhabitants; but in large towns and certainly in the suburban areas of the metropolis a late dispensing service scarcely exists. If a prescription marked urgent is given to a patient after 8 P.M., in the great majority of cases it is brought back to the doctor with the statement that no reply could be obtained at any of the chemists and would the doctor make it up. Our contemporary suggests that it should not be outside the knowledge of any well-informed panel practitioner what chemists in his vicinity can be relied upon to render late service when properly required to do so. But it is no part of any insurance practitioner's terms of service to advise a patient where to take his prescriptions to be made up; in fact he breaks regulations if he specifies any particular chemist—insurance committees often receive complaints from chemists that Dr. X always sends his patients to Mr. C to have his prescriptions made up. Under the chemist's terms of service he cannot be required to open his premises after closing hours even if he is on the premises and the patient has a prescription marked urgent.

Not long ago an insured person complained that he was unable to obtain the medicine ordered for him by his doctor. In order that he might obtain it the same night the doctor gave the patient a prescription marked urgent. He left the surgery at 8.5 P.M. and arrived at chemist A ten minutes later. The door was shut but the lights were on and the proprietress and her dispenser could be seen in the shop. The door was not opened and the patient went on to chemist B. Here the lights were on and two men were visible in B's shop; there was no response at the shop door, so he knocked at the house door which was opened by the chemist's wife who when informed of the urgent prescription said "they were all gone." The patient returned to chemist A at 8.20 P.M., and after enlisting the aid of a constable knocked again; but during the knocking the lights were turned out. Finally he went back to the doctor who supplied him with the medicine. At the inquiry the proprietress of shop A said she remembered the knocking but it was not usual for the door to be opened once the premises were closed for the night. Chemist B said if he was available he did dispense urgent prescriptions but his wife, although she knew the prescription was marked urgent, did not tell him as she knew he had an appointment and was in a hurry to get away.

On this the inquiring committee reported:—

> It appears to us after a close examination of the scheme for securing a proper pharmaceutical service which has been made in pursuance of the medical benefit regulations, that neither chemist was contractually bound to dispense the prescription and we cannot find in the circumstances that there was a failure on the part of those chemists to comply with the terms of service. Our consideration of the case has disclosed a weakness in the arrangements which have been made for securing a proper pharmaceutical service in the area of the committee, we refer particularly to a prescription marked "urgent" which requires to be dispensed after the normal closing hour, and we think that something should be done to enable insured persons to obtain from a chemist medicines urgently required within a reasonable period after the normal closing hour.

In this case the doctor eventually supplied the medicine, but many insurance practitioners do not dispense even for private patients and the patient might not have been able to obtain it that night. There has been no alteration in the arrangements since this case was decided, so that the advice given by our contemporary to ring up the clerk of the insurance committee would be useless. Certain large chemists in the West End of London give an all-night service, but in most of the suburbs there is in no chemist's shop any indication to an insured person requiring urgent medicine after 8 P.M. where to go to get it made up.

OBITUARY

ERNEST EDMUND MADDOX, M.D., F.R.C.S.Edin.

CONSULTING OPHTHALMIC SURGEON, ROYAL VICTORIA AND WEST HANTS HOSPITAL

WE regret to record the death of Dr. Ernest Edmund Maddox, the well-known ophthalmologist, which occurred on Nov. 4th, at his residence in Bournemouth, at the age of 73. The son of Mr. J. F. Maddox, of Shipton, Oxfordshire, he was educated at Mill Hill School and pursued his medical studies at the University of Edinburgh. He was a successful student, first medallist of his year in physiology, and graduated as M.B., C.M. in 1882, proceeding to the M.D. degree in 1889. He had already shown his surgical bent by winning the Syme Surgical Fellowship, and choosing ophthalmology as his specialty, he was appointed assistant ophthalmological surgeon at the Edinburgh Royal Infirmary and University instructor on the subject in the wards. He took the F.R.C.S. Edin. in 1894, and for the next five years continued to work in Edinburgh with an increasing reputation as teacher and operator. He left Edinburgh in 1899 to take up the appointment of ophthalmic surgeon to the Royal Victoria and West Hants Hospital, and the rest of his ophthalmic work was done at Bournemouth and is recorded in his own clearly written works. In 1900 he was awarded the Middlemore Prize of the British Medical Association for the most important contributions to ophthalmology made during the three previous years, the work which specially dictated this appointment being the Tests and Studies of the Ocular Muscles, a particularly level-headed presentation of the facts which obtained a large circulation in America. But the originality of Maddox's teaching was best displayed in his book entitled "The Clinical Use of Prisms and the Decentring of Lenses." Here he drew attention to the treatment of the anomalies of the extrinsic muscles of the eye. His ocular demonstration of the points made through the medium of geometrical methods was found to be thoroughly ingenious, while the methods of treatment of latent muscular anomalies

as advocated by him, were very generally accepted. This book was followed by another, "The Golden Rules of Refraction," which also obtained well-earned favour and ran through several editions. It was described by the author as "a little miniature of a subject to which only a large volume could do justice," and as a practical help to practitioners and students in the study of refraction it formed a useful book of reference. He was also the author in the Encyclopædia Medica of the article on refraction, and in Latham and English's "System of Treatment" he wrote on the mechanism of the ocular muscles. At the Oxford Ophthalmological Congress, in 1921, he delivered the Doyne memorial lecture and received the Doyne memorial medal.

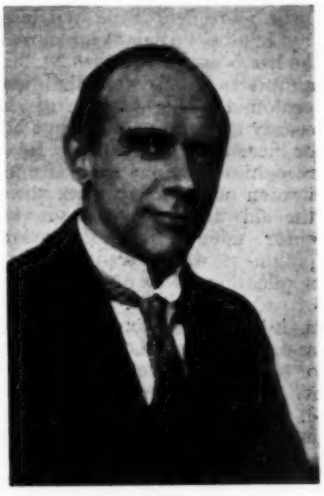
As would, therefore, be expected, Maddox was well known throughout the ophthalmic world, especially for his studies of the ocular musculature in connexion with binocular vision. During the whole of his working life—i.e., for 50 years—he never ceased to work at problems connected with this branch of ophthalmology. So early as 1883, a year after graduation, he described before the Ophthalmological Society an apparatus for testing convergence, while his last important communication to the society was made in 1929—a brilliant paper on heterophoria, opening a discussion on that subject. Maddox was extraordinarily inventive, and his name will remain familiar to all ophthalmic surgeons on this account. A simple invention known as the "Maddox Rod" is almost universally used as a test for ocular imbalance in the routine examination of the eyes. One of the simplest and at the same time the most practically useful of the numerous apparatuses now used in connexion with the orthoptic treatment of squint we owe to him. This is the "eye-wakener" or "Cheiroscope," a device whereby an eye of a squinting child, rendered partially amblyopic by non-use, is educated by a method which excites the child's own interest. The child is caused to make a conscious effort with his hand, while his brain is also unconsciously educated to perceive the image thrown on his retina by means of that effort. Other ingenious devices by Maddox useful to the ophthalmic surgeon, are his V test for astigmatism, his axis-finder, and his electric eye-warmer. His high position in ophthalmology was widely recognised. He was at different times president of the ophthalmological section of the Royal Society of Medicine, president of the ophthalmological section of the B.M.A., and a member of the Société Française d'Ophtalmologie.

Dr. Maddox married Grace Rivers, daughter of Alexander Monteith, C.S.I., of Broich, Crieff, Perthshire, by whom he had a large family.

ARTHUR LIONEL BALY, M.R.C.S.

MEDICAL SUPERINTENDENT OF LAMBETH HOSPITAL

Arthur Lionel Baly, whose death occurred on Oct. 31st last, was born in 1880, the youngest son of the late Mr. Charles Baly, a well-known dental surgeon. He was educated at Highgate School and Emmanuel College, Cambridge, and after graduating in arts proceeded to University College Hospital for his medical training. He qualified as M.R.C.S., L.R.C.P. Lond. in 1906, and served as house physician at the Victoria Park Hospital until, in 1907, he became assistant medical officer at the Lambeth Infirmary, thus beginning an association that was to last for over 25 years. In 1911 he was appointed medical superintendent of the infirmary, the title of which was shortly after changed to Lambeth Hospital. Even before his appointment as superintendent he had taken a special interest in the problems of administration, which in one form or another were to form his life's work. The 23 years during which he was in charge at Lambeth were marked by notable development in the medical and surgical services rendered by the poor-law hospitals, and the great changes which accompanied these developments provided ample opportunity for Baly to show his genius for organisation. He was a strong advocate for decentralisation, not only in the larger matters of public life, but even in the details of administration of his own building. He realised that in order to secure the enthusiastic coöperation of those working in the building, it was best to give them as much responsibility as was compatible with efficiency, and to hamper them by the fewest possible regulations. It was characteristic of him that although placing responsibility on other shoulders, he was always willing to take the blame when things went wrong. He was particularly concerned in the well-being of the nursing staff, and was resolute to promote the efficiency of the hospital as a training school for probationers, in whose welfare he coöperated very generously with the matron. He provided and maintained a fund at his own expense to be used for the recreation of the nurses or to assist any of them in sickness or adversity. In his professional work he had to a very high degree the faculty of raising enthusiasm and securing the loyalty of his colleagues and juniors, which enabled him to make the hospital, for the management of which he was responsible, remarkable for its economy and efficiency.



MR. BALY

[Photograph by Elliott and Fry

As soon as Baly came to Lambeth he began to take an active part in the social work of the district, taking over the organisation of the 5th Lambeth troop of Boy Scouts, and becoming a manager of the Archbishop Temple school. He ran his troop with characteristic enthusiasm, paying special attention to athletics and particularly to boxing. In 1922 he founded the Fitzroy Lodge Athletic Club (the name of which was taken from the house of which he was a member at Highgate School), and later the Fitzroy Lodge Trust, which he endowed so as to secure the continuation of both clubs. The Fitzroy Lodge athletic club has gained a considerable reputation in many branches of sport, especially in boxing, several well-known amateur boxers having been trained by the club. Baly was for a time a member of the sports committee of the London Boy Scouts' Council, and for many years an honorary medical officer to the Amateur Boxing Association, and in that capacity accompanied the Olympic team to Amsterdam. Baly's deep interest in athletics had a touching side, for an accident in infancy had left him with a left

hemiparesis; he was, however, when at Cambridge, cox of his college boat.

Baly was unmarried. He had a large number of personal friends, for he had travelled widely in Europe and America, and his great interest in human nature led him to cultivate the friends that he made. He was buried at Hampstead Cemetery on Nov. 3rd, and a memorial service held in the hospital chapel was numerously attended.

SIR GEORGE MAKINS

WE have received the following tributes among others to the memory of Sir George Makins from his colleagues.

Dr. H. G. Turney writes: "In some ways Makins offers a tempting subject for an appreciation, since the picture that he presents is from decade to decade one of remarkable stability; for example, during the past ten years the lines in his face got a little deeper, his speech a little more deliberate, and his gait somewhat slower, but in all essentials the man remained the same, and so he has been for the past 20, 30, or 40 years. It seems almost as if this were the outward expression of the profound conservatism of his nature. But this sturdy conservatism did not blind him to the wisdom or necessity of change. He was always ready to recognise this, but his attitude of mind was that the burden of proof lay upon the new rather than upon the old, and with that proviso he was prepared to enter upon its consideration without bias. His judgment was extraordinarily good, whether in its application to his professional activities or to matters of administration. His strength in counsel lay mainly in the absolute independence of his judgment, and in the fact that whatever might be the difference of opinion he never felt antagonism and never aroused it. He was as prepared to stand up against a roomful of friends as one of enemies, and that is a very remarkable quality. He was a clear thinker and clear talker, but he was not dogmatic enough to have a great vogue as a teacher, and his students were wont to follow his deeds rather than his words. He was always in sympathy with the young, and as he lost his old friends by death the gaps were up to a point filled by the new generation, and so as time went on he was both loved and venerated by everybody at his old hospital, irrespective of age. Whenever two or three of these were gathered together it would not be long before the talk swung round to 'dear old Makins,' and then would be heard one or another of the many variants of his alleged response to an applicant for advice, 'Why can't you let it alone?'

"As a talker Makins was delightful, at his best perhaps in a tête-à-tête. His voice had a deep pitch with a pleasant modulation which made it most restful to the ear, and the matter was always full of delightful human interests with never a trace of malice. He was more prone to smile than laugh, and his smile is unforgettable. He was never in a hurry—in fact he seemed almost ostentatiously free from any temptation in that direction, and in some notes of his on his life he describes himself as naturally lazy; but, as a matter of fact, he was an intense and continuous worker, only very often the results appeared under other names than his own, and he got no credit for them. In truth, his writings smelt somewhat of the lamp at times, and this may well have been due to the conditions hinted at above. It is no exaggeration to describe Makins as one of the best loved men in the profession; but he was never a hunter for popularity, and his many honours came to him unsought. His only reference to himself generally took the form of humorous self-depreciation, but his many friends are glad to know that he was fully aware of his wealth in their affection."

Mr. W. H. Battle writes: "All who know the amount of work which Makins did for his hospital, for English surgery, and for the country, feel that a really great man has passed away. His pleasant manner and clear enunciation saved unnecessary debates on committee with his colleagues. He was ready of access to the student in times of difficulty, and had a universal kindliness of disposition that awoke affectionate regard in those around him."

Sir Charles Ballance writes in particular reference to Sir George Makins's work during the European war: "There are not two surgeries, one of war and one of civil life, but one surgery which is founded on fundamental principles universally applicable. Makins possessed the great asset. He had seen the surgery of suppuration and septic infection before the teachings of Joseph Lister had begun to permeate the profession; so that the terrible suppurations following gunshot injuries were not an entirely new experience to him as to the majority of medical men who volunteered for war service. George Makins was an ideal consulting surgeon. He was somewhat shy, sensitive, and reserved, but the qualities of friendly sympathy, learning, and camaraderie fitted him in a special way to assist the medical officers of the army, who were faced with strange problems entirely foreign to their previous experience. I entered as a student in the same year as Makins, and in those days the only treatment of acute intestinal obstruction was a left lumbar colotomy; though an occasional gastrostomy was performed, gastro-enterostomy and intestinal anastomosis were unknown. In 1882 Makins successfully resected the small intestine in the operation theatre of St. Thomas's. I remember the profound impression caused. Some two or three years before the great war I was talking to William Mayo in the theatre of St. Thomas's where Makins was performing a difficult abdominal operation, and at the end Mayo said, 'That is the man I should choose to operate on me!' Makins has left behind him a goodly company of devoted friends and admirers. He will be remembered with affection for what he has done and for what he was. His influence will persist in the lives of those who knew him. He has now joined the majority but he will continue to live in succeeding generations of St. Thomas's men—unconsciously inspired by his conscientious work and by his life of service to surgery."

Dr. J. A. Murray writes: "On the Executive Committee of the Imperial Cancer Research Fund, Sir George Makins's tenure of the office of treasurer was marked by a great increase in the Fund's resources, obtained without any restriction of the provision for the needs of the investigations. At all times his sympathy with the aims and endeavours of the laboratory staff was complete and manifest. Of his personal kindness I need say no more than that he was one of those who inspire feelings of affectionate respect in those fortunate to come into close contact with him."

ROBERT CALVIN COFFEY

Dr. Robert Coffey, of Portland, Oregon, U.S.A., who lost his life last week in an aeroplane crash, was well known as an abdominal surgeon on both sides of the Atlantic. Last autumn on his way to urological congresses in Paris and Rome, where he was to report on ureteral transplantation, he paid a visit to this country and opened a discussion at the Royal Society of Medicine on the treatment of cancer of the rectum; he was complimented then on the

extraordinarily low mortality of the two-stage operation in his hands. Dr. Coffey was a complete believer in the natural powers of the peritoneum, and advocated a particular method of drainage which he called the quarantine pack, with the object of walling off an infected area according to the plan of nature when unassisted by art. He satisfied himself that the drainage by this pack was rarely followed by post-operative adhesions. His best known book deals with the treatment of gastro-enteroptosis, for which he had devised a particular treatment of his own.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

University Degrees Bill

THE House of Lords, on Wednesday, Nov. 8th, considered the University Degrees Bill in committee.

Lord JESSEL said that objections were still raised to the measure by the Universities Bureau of the British Empire. He had, however, arranged for a conference of the parties interested and he hoped that as a result he would be able to bring forward a Bill which would command general agreement. In the circumstances he moved that the Bill be withdrawn.

The Bill was accordingly withdrawn.

Employment of Young Persons

In committee of the House of Commons on Nov. 8th, when the Expiring Laws Continuance "No. 2" Bill was being considered, Mr. RHYS DAVIES moved to leave out from the Schedule, Section 2 of the Employment of Women, Young Persons and Children Act, 1920. The provision to which he objected was, he explained, what was commonly called the two-shift system. It provided that an employer on an appeal to the Home Office, and after satisfying certain conditions, could secure an Order for employing his workpeople contrary to the provisions of the factory laws for eight hours a day at any hour between 6 A.M. and 10 P.M. at night. The provisions applied to young persons from 16 years of age and upwards. In 1921 there were 146 such Orders issued and the number had grown until it reached 227 in 1931, 293 in 1932, and up to Oct. 31st of this year the number was 267. One Order might affect a thousand workpeople and there was no information to show their ages. It was a monstrous state of affairs, he said, that this country was rapidly reaching the position where people were employed on two shifts a day just as if we were in the middle of a period of trade prosperity.—Mr. MCENTEE said he did not believe that there was anyone in any political party in that House who would disagree with the view that it was detrimental to the general health of the young people.—Viscountess ASTOR said there ought to be a national policy for juveniles as far as factories were concerned.

Mr. HACKING (Under-Secretary for the Home Department) said he would like to make it clear that the same people did not work during two successive shifts, nor did the Act make it possible for women, young persons, and children to be employed at night. If the organisations representing a majority of the employers and a majority of the workpeople in any industry made a joint representation against the granting of Orders in that industry then the power of the Home Secretary to make Orders under the Section of the Act ceased as regarded that particular industry. No such representations had been received, and all these Orders, with one exception, were still in existence. It was difficult to ascertain the actual number of persons affected directly or indirectly, but to-day, at a guess, there were about 50,000 or 60,000 persons affected directly or indirectly. But for this extra shift half the shift workers, at any rate, in most cases, would be unemployed. As to the effect on the health of the workers, he could only quote from the report of an investigation made by the Industrial Fatigue Research Board into the two-shift system in certain factories. That report, under the heading of sickness, stated:

"No conclusive statistical evidence has been found of a greater amount of sickness under one system than under the other."

Again the report said:

"When the visits were grouped by departments, it appeared that the total sickness of the departments on shift work was exactly the same as that of the departments on day work. It appeared that only half as many days were lost through sickness by the shift workers as by the day workers and that there were only about half as many visits to the first-aid room."

That really looked, on balance, as though these young persons engaged on the two-shift system were in better health than those engaged on ordinary day work.

The amendment was rejected by 253 votes to 57.

Criminal Use of Firearms

Mr. HACKING moved the second reading of the Firearms and Imitation Firearms (Criminal Uses) Bill. He said that by this measure it was intended to make it an offence for a person to use, or attempt to use a firearm, or imitation firearm, either for the purpose of resisting the lawful apprehension or detention of himself or of any other person, and they also wished to make it an offence if a person was found in the possession of such an article when committing, or when arrested for, the offences specified in the Schedule to the Bill. It might be complained by critics that the Government were legislating ahead of necessity. It was true that gunmen were not so numerous in this country, or so daring as they were in other parts of the world, but the desire was to prevent this profession from becoming a popular or a remunerative one.

The Bill was read a second time.

Local Government Bill

Sir E. HILTON YOUNG (Minister of Health) moved the second reading of the Local Government Bill. He said it was a big measure, the purpose of which was the consolidation of the law of local government for England and Wales. It did not cover, in general, the City of London, which was dealt with by its particular statutes. The magnitude and the utility of the Bill was shown by the fact that it repealed, wholly or partially, not less than 900 sections of other Acts of Parliament and 33 schedules, and that it repealed 47 Acts wholly, thus effecting a very great simplification of the law and, incidentally, a very great economy in the conduct of public business. This was an instalment of a long process of simplification, classification, and consolidation of local government law which had been in progress now for a good many years. They had now codified the poor-law, the housing law, the law relating to the sale of food and drugs, and the law relating to national health insurance. He hoped after the passing of the present measure no long period would elapse before there was another and final instalment of this codification in a Bill to codify the law relating to public health. That would be the biggest task of all, because the law of public health needed codification almost more than any other section relating to local authorities and their powers.

The Bill was read a second time.

National Health Insurance

POSITION OF UNEMPLOYED PERSONS

In the House of Commons on Friday, Nov. 10th, Mr. GEORGE HALL moved:

"That, in the opinion of this House, the hardships arising from long-continued unemployment will be unduly

aggravated by denial of the benefits conferred by the National Health Insurance and Contributory Pensions Acts, and, therefore, provision should be made for a State contribution towards safeguarding the position of those insured persons who are victims of the present industrial depression."

The full effect of the Act was, he said, not realised when the measure was passing through that House. Whatever the cost to the State to maintain these persons in insurance it should be readily agreed to. The cost to the Exchequer of securing pension rights for the next three years was estimated at £450,000, or £150,000 a year. If there was an additional £50,000 or £60,000 to keep these persons in medical benefit it would mean a cost of £200,000 a year. He appealed to the Government to reconsider their attitude.

Major MUIRHEAD asked the Minister whether something might not be done to ease the situation by extending the period of redemption of arrears.

Mr. BUCHANAN said that medical benefit was important, and he wished to say that the medical profession was about the only one which had risen in his estimation since he entered Parliament. He thought that the services rendered by the ordinary panel doctor were worthy of the highest commendation from every decent man and woman. The panel doctors from one end of the country to the other were in very difficult and trying circumstances, rendering in the main services of a very noble order. But he did not want the House to regard this question merely as a question of medical benefit. There was a tendency to make it a question of medical benefit alone, and to make it appear as if it were a ramp by the medical profession to safeguard their panel money. There were other benefits involved in addition to medical benefit. He feared even more than Mr. Hall the position of the local authorities in this matter. He would not be so much annoyed about the loss of medical benefit if he was sure that the poor people would even get the services of the public assistance doctors; but he feared that they would get no doctors at all; that in the general turnover many of them would be crowded out and would, practically speaking, get no medical benefit whatever. To-day the average doctor who did poor-law work was overworked, and the public assistance authorities were grumbling about high rates. He took it that to perform this work properly additional doctors and additional staff might be required. He feared that the authorities might undertake to do this work without the added staff necessary, and that numbers of decent men and women would in consequence not receive any treatment at all.

THE MINISTER'S STATEMENT

Sir HILTON YOUNG (Minister of Health) said that the whole purpose of the Act of 1932 was to give solvency to a scheme which was threatened with insolvency by restoring the balance between contributions and benefits. The cause of the enfeeblement of the health insurance scheme was the failure of contribution income owing to the steady increase of unemployment. Immediate action had to be taken to protect the rights of insured persons. Very big concessions had already been made in order to alleviate the position as regarded arrears. As long as a man remained in insurance he might draw his medical benefit and he might draw his maternity benefit in spite of a year of unemployment, apart from the payment of any arrears at all. A minimum of merely 20 weeks of work and contribution would always give an insured person some cash benefit. With a view to giving further assistance to those who were falling into arrears, after consulting his advisers, he thought it was possible to extend this period of grace to March 31st in the year following. That would deal with many or most of the cases of hardship. Those who went out of insurance at the end of this year did not lose medical treatment. They would then receive precisely the same medical treatment as any unemployed person who had not been in insurance would receive. It would be the duty and task of the local authorities to see that the services were adequate and the Ministry would make sure that they did. The cost would fall upon local authorities and he believed it had been very much exaggerated. The Government Actuary's estimate in 1932 of the number of persons affected was 80,000, but employment had somewhat improved since that date. In many small areas such persons would continue to be attended by precisely the same doctor as attended them when they were on the panel. In larger areas, where there were well-organised public health and public assistance services, it would be possible to make use of the staff and scientific equipment of the new public hospital organisation. The fact that these persons would have no free choice of doctor was a difficulty, but it could be met in this way. It was open to any authority to make use of a panel system for its public assistance organisation. Experiments had been made in that direction in Newcastle-on-Tyne, East Ham, and Wiltshire. If any authority desired to act in this way the sanction of the Ministry of Health would not be lacking.

Sir RICHARD MELLER said he thought that the House would be wise to maintain the insurance principle of the health insurance scheme. He thought that the sacrifices which had been made by the approved societies went as far as they could go, consistent with the solvency of the fund.

Sir FRANCIS FREMANTLE said he would not depreciate the work of the poor-law medical officers, but there were certain parts of the country where local authorities and public assistance committees had inherited old appointments and systems from the old guardians.

Those fixed appointments, said Sir Francis, were in certain cases by no means satisfactory; the poor-law authorities got by no means the best men in the profession locally to undertake this poorly paid and hard-worked employment. The result, as everybody knew, was that the poor-law medical service was not the equivalent of the panel service. That was not because the individuals were different; they knew that great objections had often been raised in that House to some parts of the panel practice. But there was this very great difference, that under the poor-law there was a fixed definite appointment of one man, or of one or two men, in any particular area, and everyone had to go to the appointed officer, and no other. Under the panel system they had established the choice of doctors, and that was the one thing that was an element of progress and the one thing that enabled the service to adapt itself to requirements automatically, because if the medical man did not give the service that was required by the patient he could change his doctor. They were delighted to hear from the Minister of Health that there were three areas already where the public assistance committees had undertaken the open choice methods of medical attendance. Where that happened they were, he hoped, arriving at an ideal which was being worked out—namely, that there should be only one system of medical attendance under the State, that was the open choice method, open to all medical practitioners who undertook the terms of the panel. This was really a reform of the greatest magnitude in the improvement of the medical service and the health of the people in the whole of the country, and it had been adopted by mutual agreement in three areas. Would it be possible for the Minister to hasten its general application to the rest of the areas?

If, he continued, the Minister could get the system adopted throughout the country there would be an enormous improvement in the general health of the people, and he believed that it would do away to a large extent with the grievance that otherwise existed that people who had been insured under one system or the other, because they had fallen out of the jealously guarded system of insurance, had to go to another set of medical men who did not understand their conditions and had not their dossier over which they had no right of choice.

Mr. ARTHUR GREENWOOD said that the Opposition would have preferred the Government to have kept national health insurance on its own financial basis, but having lost its financial stability they would not

have regarded it as destructive of that principle if the State had come to the assistance of those who were now to be deprived of benefits which they had enjoyed in the past. What they would get by a continuation of this scheme was a permanent pauperisation of people who were the victims of circumstances over which they had no control.

"A SLUR ON THE DISTRICT MEDICAL SERVICE"

Mr. SHAKESPEARE (Parliamentary Secretary to the Ministry of Health) replying to the debate, said that the scheme did not mean that 80,000 persons must be thrown on to the medical side of public assistance. It would probably mean that about 20,000 or 30,000 would at some time of the year have recourse to the district medical service. He really must challenge Sir F. Fremantle, who had suggested that the district medical service was inferior to the panel service. He denied that, for the simple reason that in, for instance, any county borough divided into medical districts, the general practitioners themselves carried on the district medical work. It was a slur on the district medical service to say that that service was inferior to the panel service. In the great majority of cases people were treated by the same doctors as those in the panel service.

Mr. LOGAN: I take it that it is the Minister's intention to set up a State service, or local service of panel doctors, to deal with these particular cases. If that is so, what about those doctors who are already occupying the position, and what compensation will be given them for disturbance of office?

Mr. SHAKESPEARE said that the Minister had shown that there were three places where a panel system was in operation. He was putting no bar to the extension of that principle. It was in the experimental stage, but if there was a real objection to it, his right hon. friend would do his best to meet what might be a real difficulty.

The motion was negatived by 161 votes to 48.

Hospitals and Motor Accidents

In the House of Lords on Tuesday, Nov. 14th, when the Road and Rail Traffic Bill was being considered in committee, Lord LUKE moved the following new Clause:—

Section 36 of the Road Traffic Act, 1930 (which relates to requirements in respect of policies of insurance) shall be amended by substituting for subsection (2) thereof the following subsection: (2) Where any payment is made (whether or not with an admission of liability) by—(*a*) an authorised insurer under or in consequence of a policy issued under this Part of this Act; or (*b*) the owner of a vehicle in relation to the user of which a security under this Part of this Act is in force; or (*c*) the owner of a vehicle who has made a deposit under this Part of this Act; in respect of the death of or bodily injury to any person arising out of the use of a motor vehicle on a road or in a place to which the public have a right of access, and the person who has so died or been bodily injured has to the knowledge of the authorised insurer or such owner as the case may be received treatment at a hospital whether as an in-patient or as an out-patient in respect of the injury so arising there shall also be paid by the authorised insurer or such owner to such hospital the expenses reasonably incurred by the hospital in affording such treatment after deducting from such expenses any moneys actually received by the hospital in payment of a specific charge for such treatment not being moneys received under any contributory scheme: Provided that the amount to be paid by the authorised insurer or such owner shall not exceed fifty pounds for each person so treated as an in-patient or five pounds for each person so treated as an out-patient.

For the purposes of this subsection the expression "hospital" means an institution (not being an institution carried on for profit) which provides medical or surgical treatment for in-patients and the expression "expenses reasonably incurred" means—(*a*) in relation to a person who receives treatment at a hospital as an in-patient, an amount for each day such person is maintained in such hospital representing the average daily cost for each in-patient of the maintenance of the hospital and the staff thereof and the maintenance and treatment of the in-patients therein; and (*b*) in relation to a person who receives treatment at a hospital as an out-patient reasonable expenses actually incurred.

He said that at present many hospitals situated near the great highways were occupied with motor-accident cases to the exclusion of those patients for whom the hospitals were originally provided. A clause in similar terms to the one he moved had been included in Lord Danesfort's Road Traffic (Compensation for Accidents) Bill, but as that Bill could not be passed at an early date, and as the hospitals could not wait, he hoped that the Government would agree to this new clause being inserted in the present Bill.

Lord GREVILLE, as treasurer of one of the larger London hospitals, asked the House to accept this new clause. In 30 per cent. of the cases they did not receive any payment at all for motor-accident treatment. The limit at present was £25, but in one case the cost to the hospital was £125.—The Earl of DERBY said he could substantiate what had been already said. At present the treatment of motor-accident cases was an intolerable burden on the hospitals. He thought, however, that the present Bill was an inappropriate measure in which to incorporate such a clause. The clause was incorporated in Lord Danesfort's Bill and he hoped that that Bill would be passed into law.—Earl HOWE said that the voluntary hospitals of the country were out of pocket in respect of the cost of the treatment of these cases to the extent of no less a sum than £150,000 a year at least. But if the House passed this clause they would still not completely cure the the trouble. This clause might mean an increase in insurance premiums all round.—The Marquess of READING said as far as he understood the position, Lord Danesfort's Bill had not the faintest chance of being passed in the House of Commons.—The Earl of DONOUGHMORE and Lord PONSONBY supported the new clause.

The Marquess of LONDONDERRY, replying for the Government, said that they must all have sympathy with the object of the new clause, but he felt that it was not appropriate to the present Bill. This was a measure for the better regulation of goods traffic, and the House of Commons might feel that a provision of this kind was not germane to the Bill.

The new clause was agreed to without a division.

HOUSE OF COMMONS

THURSDAY, NOV. 9TH

The Offence of Sleeping Out

Mr. MCENTEE asked the Home Secretary the result of his inquiry as to the circumstances in which it was the practice of the police to charge persons with the offence of sleeping out.

Mr. MANDER asked whether the Home Secretary's attention had been called to Police Order No. 565, issued by the chief constable of Wolverhampton; and whether he would see that the matter was treated throughout the country on the same lines.

Brigadier-General SPEARS also asked a question on the same subject.—Sir J. GILMOUR (Home Secretary) replied: My attention has been called to the police order to which Mr. Mander refers. The replies which I have received from chief officers of police indicate that persons are not as a rule arrested and charged under this provision in the Vagrancy Act unless there is ground for thinking that they are of bad character, or they are found in circumstances likely to cause danger or nuisance to the community. I am satisfied that it is the general practice to use this power sparingly, but I propose to consider the question whether it is possible to define more closely the circumstances in which proceedings are necessary or desirable.

Licensing

Viscountess ASTOR asked the Home Secretary whether it was the intention of the Government to introduce legislation to give effect to the report of the Royal Commission on Licensing.—Sir JOHN GILMOUR replied: I

have nothing at present to add to my answers to previous questions on this subject. No such legislation is contemplated in the immediate future.

Six-loom Weaver System

Mr. RHYS DAVIES asked the Home Secretary if he would request the appropriate medical authorities to conduct an investigation into the effects on the physique of women employed in the textile industry of Lancashire on the six-looms-per-weaver system, and issue a report thereon.—Sir JOHN GILMOUR replied: The Factory Department will carefully watch for any ill-effects on health which may appear to arise from this system, but I am advised that a special investigation at the present time would not be likely to lead to any definite results. The system has only recently been introduced and there are no sufficient data on which conclusions could be based

Sir F. FREMANTLE: Has this matter been referred to the Industrial Health Research Committee, whose business it is to look into these matters?

Sir J. GILMOUR: I am not sure of that.

Slum Clearance

Sir FRANCIS FREMANTLE asked the Minister of Health the number of local housing authorities that had not submitted to him programmes of slum clearance; what steps he proposed to take to secure effective action in such cases; and whether he was satisfied with the progress being made throughout the country to secure clearance of all slum areas within five years.—Sir HILTON YOUNG replied: There are 1717 local housing authorities, and of these 1341 are county district councils. I have received 1176 returns. There are thus 541 outstanding, including 418 from county district councils. In any case in which a local authority has submitted no programme, and I have prima facie evidence that a programme should be submitted, I shall, after communications of the usual sort, proceed to secure the holding of a public local inquiry into the position under Sections 35 or 52 of the Act. As to the last part of the question, in general the local authorities' programmes are satisfactory.

Sir FRANCIS FREMANTLE: Does the right hon. gentleman think he will be able to secure clearance of all slums in five years?

Sir HILTON YOUNG: The answer is just what I have said; the programmes are a satisfactory reply to the request that I have addressed to the local authorities.

Major NATHAN asked the Minister of Health whether he had received any definite programme of the unhealthy areas to be cleared or improved by the London County Council under the provisions of the Housing Act, 1930, during the next five years, as called for in his Housing Circular 1331.—Sir HILTON YOUNG replied: I received early in August a comprehensive report from the county council containing a programme for the displacement and rehousing within a period of ten years of a quarter of a million persons. I am expecting a supplementary and more detailed report shortly. I would remind the hon. Member that it was recognised in Circular 1331 that the time needed to remedy the present deficiencies in London will be longer than in other areas.

Housing

Mr. H. WILLIAMS asked the Minister of Health the total number of houses constructed during the six months ended Sept. 30th, 1933, and for comparison, the corresponding number during the same period of the previous year.—Sir HILTON YOUNG replied: The total number of houses completed in England and Wales during the six months ended Sept. 30th, 1933, was 113,332. The corresponding number for the six months ended Sept. 30th, 1932, was 95,515. The increase in comparison with the earlier period is thus 17,817 or 18·6 per cent. These numbers exclude houses of a rateable value exceeding £78 (£105 in the metropolitan area.)

Sir FRANCIS FREMANTLE asked the Minister of Health the number of houses for which guarantees had been given by the Government under Section 2 of the Housing (Financial Provisions) Act, 1933.

Major NATHAN asked the Minister of Health whether he had received any progress returns from local authorities in connexion with their administration of the Housing (Financial Provisions) Act, 1933; and, if so, what were the respective total numbers of houses completed at a recent date in the metropolitan police district and in the rest of England and Wales with the assistance of guarantees under that Act.—Sir HILTON YOUNG replied: I have received proposals from local authorities for giving guarantees in respect of approximately 13,000 houses. I shall not, however, be in possession of information as to the numbers of houses for which guarantees have been given until I receive the returns due from local authorities on Dec. 31st next.

Mr. CURRY asked the Minister of Health the number of houses built in England and Wales in each of the years ended Sept. 30th, 1932, and Sept. 30th, 1933, by local authorities, by State aid, private enterprise with State aid, and private enterprise without State aid.—Sir HILTON YOUNG replied: The total number of houses built without State assistance in the year to Sept. 30th, 1933, which is 167,880, breaks the record. The following statement gives particulars of houses provided with and without State assistance in England and Wales.

Year ended Sept. 30th.	With State assistance.		Without State assistance.		Totals.
	By local authorities	By private enterprise	By local authorities	By private enterprise	
1932	66,434	2,656	2,056	130,830	201,976
1933	47,977	2,456	1,236	166,644	218,313

The Retail Price of Milk

Mr. LAMBERT asked the Minister of Agriculture what action was intended to be taken by the Milk Marketing Board in order that permitted increases in the retail price of liquid milk would not so reduce consumption as to further intensify the glut already existing in milk production.—Mr. ELLIOT replied: It is in the interests of milk producers as a whole that the aggregate returns from the sale of milk for liquid consumption and for manufacture should be as large as possible, and I am confident that the Board will make the best use of their powers to ensure that the price position does not lead to reduced consumption in the liquid milk market.

Shortage of Water-supply

Mr. CURRY asked the Minister of Health if complaints of a shortage of water-supply were received from any local authorities during the past summer; and, if so, how many such complaints were received.—Sir E. HILTON YOUNG replied: Very few actual complaints were made by local authorities to the Ministry. In some 30 instances investigations were made by my officers in addition to inquiries as to the position made by inspectors at all visits to local areas. The towns generally met the drought in a successful manner, the difficulties being mainly in rural areas.

Mr. RICHARD EVANS asked the Ministry of Health whether, in view of the hardships caused by the failure of water-supplies in many areas during the summer, he would consider making grants to enable local authorities to proceed with water schemes now held up on the ground of cost.—Sir E. HILTON YOUNG replied: I am anxious that every effort should be made to improve the water-supplies in areas inadequately served, and I am aware that in some cases, generally in rural areas, the difficulty is one of cost. I may perhaps remind the hon. Member of the powers of financial contribution conferred on rural district councils and county councils by the Local Government Act, 1929.

Disposal of London Refuse

Mr. MCENTEE asked the Ministry of Health whether the Advisory Committee on London Refuse had reached any conclusions for the improvement of the disposal of refuse; and, if so, if he would state the nature of the proposals.—Sir E. HILTON YOUNG replied: I am informed that the Committee have done a large amount of work but have not yet completed their survey of present conditions, and that they hope to do so and to make their report on the disposal of house refuse possibly by next Easter.

MONDAY, NOV. 13TH

Medical Branches of Defence Services

Sir VIVIAN HENDERSON asked the Prime Minister what action he proposed to take on the report of the Committee on the Medical Branches of the Defence Services.—Mr. MACDONALD replied: Certain aspects of the report have been felt to require further consideration; but my hon. friend may rest assured that there will be no avoidable delay in reaching a conclusion.

TUESDAY, NOV. 14TH

High Temperature in Deep Mines

Mr. TINKER asked the Secretary for Mines if His Majesty's inspectors had drawn his attention to the high temperature prevailing in the deep mines, in some instances exceeding 100°; and if he would consider amending the Coal Mines Act so as to prevent men working where the temperature exceeded a certain point.—Mr. E. BROWN replied: I would refer the hon. Member to the answer given on July 11th (see THE LANCET, July 15th, p. 161), when I said that the question of high temperatures in some of the deeper mine workings is constantly engaging the attention of the inspectors, and is also being studied by the Hot and Deep Mines Committee. It is true that the air (dry bulb) temperature in some deep workings reaches, and may slightly exceed, 100° F., but the associated wet bulb temperature seldom exceeds 80° F., and it is the latter that is the more important when considering the effect of temperature upon the health of the workers. The investigations of the Hot and Deep Mines Committee have shown that acclimatised men can work without undue fatigue in wet bulb temperatures of over 80°, and there is no evidence that such work does any serious injury to the men's health or shortens their lives

Medical Officers on Cruising Liners

Sir BERTRAM FALLE asked the President of the Board of Trade what steps were taken by his department to see that those liners which catered for the holiday-cruise traffic provided medical staff of qualified surgeons and physicians, dispensers, and certified nurses proportionate to the number of passengers and crew of the ship.

Sir PARK GOFF asked the President of the Board of Trade whether a physician as well as a surgeon was provided by the ship for the service of passengers and crew of cruising liners; and how many surgeons, physicians, dispeners, and certified nurses were provided, either optionally or by regulation, for the protection of a complement of 750 persons, consisting of 500 passengers and 250 crew, carried by a liner on a holiday cruise.—Mr. RUNCIMAN replied: Vessels employed on foreign-going holiday cruises, and having 100 persons or more on board, are required by law to carry a duly qualified medical practitioner. Such practitioners are qualified both in medicine and surgery. The law does not require dispensers and certified nurses to be carried in any ship, but I am informed that a nurse is usually carried in a cruising vessel, and that in a number of cases a hospital attendant is also carried, and sometimes a second doctor.

Slum Clearance

Mr. SPENCER asked the Minister of Health in how many instances the councils of county boroughs and county districts, respectively, had informed him of the absence of slums within their areas.—Sir HILTON YOUNG replied: The respective figures are 4 and 393.

Vaccination and Meningitis

Mr. GROVES asked the Minister of Health whether any, and, if so, how many, deaths from meningitis following vaccination had occurred in England and Wales during the present year; where and at what age such cases occurred; whether inquests were held in such cases; and, if so, what were the verdicts at the inquests.—Sir HILTON YOUNG replied: Three such deaths have been reported, one each at Carshalton, Alverstoke, and Barham. The ages were 2 months, 11 weeks, and 4½ months. The verdicts were respectively, "meningitis due to an organism which may have entered the system at the site of vaccination performed on Sept. 1st, 1933"; "meningitis," and "natural causes, viz., meningitis." Inquiries were made in each case, and I am advised that there is no ground for disagreement with the verdicts.

MEDICAL NEWS

University of Oxford

At a congregation on Nov. 7th the following were elected examiners: anatomy, Mr. A. B. Carleton; physiology, Prof. Samson Wright; pathology, Prof. M. J. Stewart *; forensic medicine and public health, Dr. A. L. Ormerod *; medicine, Sir Charlton Briscoe; surgery, Mr. W. H. Ogilvie *; and obstetrics, Mr. A. H. Richardson.* Dr. J. L. Birley will be examiner in medicine between 1934 and 1936 (Hilary terms). During the same period the clinical examiners will be: medicine, Dr. F. G. Chandler and Dr. J. J. Conybeare; surgery, Mr. E. A. Crook * and Mr. L. R. Broster *; and midwifery, Mr. G. F. Darwall Smith * and Mr. Wilfred Shaw.* The asterisks indicate renominations.

University of Cambridge

The Raymond Horton-Smith prize for 1932–33 has been awarded to Dr. George Durant Kersley for a thesis on fragilitas ossium and allied conditions. Proxime accessit: Dr. John Harding Baynes Martin.

Royal College of Surgeons of England

An ordinary meeting of the council was held on Nov. 9th, with Sir Holburt Waring, the president, in the chair. A resolution of condolence was passed on the death of Sir George Makins, president of the College from 1917 to 1919.

Dr. John Beattie, associate professor of anatomy in the McGill University, Montreal, was appointed conservator of the museum and director of research, in succession to Sir Arthur Keith.

A diploma of Fellowship was granted to Thomas Francis Todd, of Guy's Hospital.

Diplomas of membership were granted to the candidates whose names appeared in our issue of Nov. 4th (p. 1069) as recipients of the L.R.C.P. and **Ng Kong Kai, Univ. Coll.** Diplomas in public health were granted to candidates whose names appear on the same page.

Royal College of Physicians of Edinburgh

A quarterly meeting of the College was held on Nov. 7th, Dr. Edwin Bramwell, the vice-president, in the chair. Dr. Eric Farquharson Dott (Edinburgh), Dr. William Leslie Burgess (Dundee), and Dr. Ronald Malcolm Murray-Lyon (Edinburgh) were introduced and took their seat as Fellows. Dr. Arthur Spencer Paterson (Hildenborough, Kent) was elected a Fellow of the College. Certificates of qualification to lecture were conferred upon Dr. John Eason and Dr. W. A. Alexander. The Hill Pattison-Struthers bursary in anatomy and physiology was awarded to Nathan Herbert Solomon, and the Hill Pattison-Struthers bursary in clinical medicine to Maurice Goldfar.

Royal Faculty of Physicians and Surgeons of Glasgow

At the annual meeting of the Faculty, held on Nov. 6th, Dr. R. Barclay Ness, on demitting office as president, reviewed the activities of the Faculty during the last two years, and expressed his satisfaction at the large increase in the number of new Fellows. The following office-bearers were elected for the ensuing year: president, Prof. J. M. Munro Kerr; visitor, Prof. Archibald Young; hon. treasurer, Dr. J. H. MacDonald; hon. librarian, Dr. W. R. Snodgrass. The members of the Council are the officers, Mr. G. H. Edington (representative to the General Medical Council), Dr. J. F. Fergus, Dr. John Henderson, Dr. A. Brown Kelly, Dr. R. Barclay Ness, Mr. John Patrick, Dr. W. J. Richard, Mr. John Rowan, Mr. J. Forbes Webster, and Mr. R. F. Young.

Harveian Society of London

The Buckston Browne prize of this society has been awarded to Dr. Lionel S. Penrose, research medical officer at the Royal Eastern Counties Institution, Colchester, for an essay on the influence of heredity in disease.

Royal Society

Foulerton Research Studentship.—The president and council of the Royal Society propose to make an appointment to this studentship, which will fall vacant on April 1st, 1934. The student will be required to devote his whole time to research in medicine or the sciences related to it, though in exceptional cases the holder of a paid teaching post may be considered. The full stipend of the studentship is £700 per annum, and the appointment is for three years. Full particulars will be found in our advertisement columns.

Consultants and Specialists at L.C.C. Hospitals

The central public health committee of the Council has decided that consultants and specialists, when called upon during the quarter under review to perform emergency work in groups of hospitals, &c., other than that to which they have been normally allocated, should receive remuneration at the rate of £2 12*s.* 6*d.* for each such emergency visit.

British Social Hygiene Council

An extraordinary general meeting of the Council will be held on Monday, Dec. 4th, 1933, at 3 P.M., at the offices of the Council, Carteret House, Carteret-street, London, S.W.1, when the Rt. Hon. L. S. Amery, M.P., will be in the chair. The following resolution will be proposed by Mrs. Ogilvie Gordon, D.Sc.: "The Council desires to place on record its view that the imposition of barriers to early marriage is incompatible with its declared policy of promoting the removal of conditions conducing to promiscuity and of preserving and strengthening the family as the basic social unit."

Chelsea Clinical Society

On Tuesday, Nov. 21st, Mr. Zachary Cope is opening a discussion at this society on the simulation of acute abdominal disease, and on Dec. 19th, the last meeting for this year, a discussion on hypnotic suggestion will be opened by Dr. A. G. Buchanan. Speakers for 1934 include Dr. Ronald Jarman (recent advances in anæsthetics), General Bruce (the Mount Everest expedition), Dr. J. A. Ryle and Dr. R. R. Armstrong (treatment of lobar pneumonia), Mr. E. G. Boulenger (the zoo aquarium), and Squadron-Leader P. C. Livingston (ophthalmic notes on the air force pilot overseas). The hon. secretaries of the society are Mr. Andrew Rugg-Gunn and Mr. H. Paxton Bayliss, 35, Harley-street, W.1. All the meetings will be held at the Hotel Rembrandt, Thurloe-place, S.W.

British College of Obstetricians and Gynæcologists

The quarterly meeting of the Council was held on Nov. 4th, with Dr. J. S. Fairbairn, the president, in the chair. Regulations for a diploma to be styled Diploma of the British College of Obstetricians and Gynæcologists (D.C.O.G.) were passed with a view to their early publication.

The following were elected to the membership of the College: Catherine Anderson, John Lloyd Davies, Calvert Mertin Gwillim, Arthur Benyon Nash, and George Milburn White. The president formally admitted to the membership: Alexander Allan, John Barnard Blaikley, Harold Carter, Robert Leslie Dodds, John Douglas Flew, Tom Ivor Hughes, William George Mackay, Patricia Massey, Douglas Ashley Mitchell, Edwin Moody Robertson, Walter Salisbury, Roy McGregor Saunders, Donald Robert Louis Stevenson, Henry James Thomson, Beatrice Turner; and (*in absentia*) John Stewart Henry, Peter Joseph Kearns, Margaret Mary Nolan, W. Philpott Newell, Walter Netley Searle, George Drury Shaw, John Ross Vant, and George Henry Mahony. After the admission ceremony Lord Riddell presented to the College portraits of the president, Dr. Fairbairn, and the hon secretary, Prof. W. Fletcher Shaw, which he had commissioned Mr. J. B. Souter to paint. Sir Ewen Maclean, the vice-president, accepted the portraits and expressed the thanks of the College to Lord Riddell.

The third dinner of the College was held at the Langham Hotel, London, on Nov. 3rd, when the presidents of the three royal medical corporations of Scotland were the guests. The toast of the guests was proposed by Dr. H. Russell Andrews, vice-president, and the toast of the College was proposed by the president of the Royal College of Surgeons of Edinburgh.

Yorkshire Association of Graduates of the University of Glasgow

The annual dinner of this association will be held in the Queen's Hotal, Leeds, on Friday, Nov. 24th, at 7.30 P.M. Sir Robert Rait, principal of the university, will be the chief guest of the evening. The hon. secretary is Dr. William MacAdam, 40, Park-square, Leeds, 1.

Instruction for D.P.M.

A series of lectures and practical courses will be given in January and February (Part I.), and in March and May (Part II.), 1934, at the Maudsley Hospital, Denmark-hill, London, S.E., primarily to candidates for diplomas in psychological medicine. The lecturers and demonstrators are Dr. F. L. Golla, Captain S. A. Mann, D.Sc., Mr. W. Le Clark, Dr. Henry Devine, Dr. Edward Mapother, Prof. F. A. P. Aveling, D.Sc., Dr. F. C. Shrubsall, Mr. Charles Geary, Dr. Thomas Tennent, Mr. Foster Moore, Dr. Bernard Hart, Dr. A. J. Lewis, Dr. Mildred Creak, Sir Hubert Bond, and Dr. W. Norwood East. Particulars of the series which begins on Jan. 1st may be had from Dr. Golla, hon. director of the medical school, at the hospital.

Fellowship of Medicine and Post-Graduate Medical Association

An all-day course in proctology will be given at St. Mark's Hospital from Nov. 20th to 25th. From Nov. 21st to Dec. 7th six lecture-demonstrations will be given on Tuesday and Thursday evenings at 8 P.M. at the British Red Cross Clinic for Rheumatism. The subjects of other forthcoming courses include: diseases of infants at the Infants Hospital, Vincent-square, S.W. (Nov. 27th to Dec. 9th); and dermatology at the Blackfriars Skin Hospital (Nov. 27th to Dec. 9th). A debate has been arranged to take place on Dec. 7th, at 8.30 P.M., at the lecture hall of the Royal Society of Tropical Medicine and Hygiene, Manson House, 26, Portland-place, W. The motion will be that operations for the removal of tonsils are too often performed without adequate cause, and all members of the medical profession are invited to be present. The secretary of the Fellowship may be addressed at 1, Wimpole-street, London, W.1.

University of Durham College of Medicine

At the annual court of governors of the College, held in Newcastle-on-Tyne on Nov. 1st, Mr. R. G. E. Mortimer presiding, a committee was appointed to consider the recommendations of Sir Amherst Selby-Bigge, to emend the constitution of the College. This committee consists of eight members of the court: Lord Armstrong, Dr. J. W. Leech, M.P. (Lord Mayor), Mr. J. R. Andrews, Mr. Charles Williams (director of education), Sir Joseph Reed (treasurer), Sir Robert Bolam (chairman of council), Prof. Stuart McDonald, and Dr. W. E. Hume—the four last being members of the council. The report of the committee appointed in July to confer with Prof. H. J. Hutchens was considered, and it was resolved "that further negotiations for a settlement with Prof. Hutchens must be conditional on his undertaking, as a term of the settlement, to abandon any legal proceedings in the matter of all his claims; but that, subject to this condition, the council would be justified in negotiating a final settlement with him on terms equivalent to those suggested in the committee's report." It is understood that the offer will be an annuity of £650 a year, the Heath professorship falling into abeyance.

A Medical Prime Minister

Mr. Godfrey Martin Huggins, who has assumed office as prime minister of Southern Rhodesia, is consulting surgeon to the Salisbury Hospital and a Fellow of the Royal College of Surgeons of England. Born at Bexley, in Kent, he qualified from St. Thomas's Hospital in 1906, and was subsequently appointed medical superintendent of the Hospital for Sick Children, Great Ormond-street. In 1910 he went out to Rhodesia and started practice in Salisbury, but during the late war he returned to Europe and saw service in France. He was also for some time surgeon to the military hospitals at Brighton and at Valetta in Malta. Mr. Huggins is 50 years of age and has been a member of the Southern Rhodesian legislative assembly since its formation.

Royal Northern Hospital

King Edward's Fund for London has made an emergency grant of £5000 to this hospital on condition that it raises a like sum of money before the end of the year.

Hospital Sunday for Coventry

In addition to its Hospital Saturday Fund Coventry is about to start a Sunday Fund on behalf of the Coventry and Warwickshire Hospital.

Wellcome Museum of Medical Science

This museum, which has been closed for the past two years, will be open again to students on and after Monday next, Nov. 20th, at the Wellcome Research Institution, 183–193, Euston-road (weekdays 10 to 5.30, Saturdays 10 to 12.30). The museum is available for all who are engaged in the study and practice of medicine; also, by arrangement with the director, for teachers who may wish to demonstrate to their classes in any of the sections.

Royal Institute of Public Health.

The next annual congress of this institute will be held at Norwich from May 15th to 20th, 1934. The work of the congress will be divided into the following sections: state medicine and industrial hygiene; women and children and the public health; tuberculosis; veterinary medicine and agriculture; and pathology and bacteriology. The address of the institute is 23, Queen-square, London, W.C. 1.

Biochemical Society

A meeting of this society is being held at University College, Gower-street, London, to-day, Friday, Nov. 17th, at 3 P.M. There will be communications on, among other subjects, the configurative relationship of thyroxine and tyrosine (C. R. Harington and others); the permeability of red cells (H. Davson); the distribution of vitamin A in the organs of the normal and hypervitaminotic rat (A. W. Davies and T. Moore); and the absorption spectrum of aqueous and vitreous humour (E. R. Robertson). One of the two hon. secretaries is Prof. H. Raistrick, of the London School of Hygiene and Tropical Medicine, Keppel-street, W.C.1.

Symposium on Bread and Milk

The symposium arranged by the food group of the Society of Chemical Industry will be held at B.M.A. House, Tavistock-square, London, W.C., on Nov. 23rd and 24th. Prof. W. W. Jameson will preside at the first session at 2.30 P.M. on Thursday, when papers on milk will be read by Prof. H. D. Kay (the improvement of the nation's milk-supply); Prof. A. J. Kluyver, of Delft (metabolism of the lactic acid bacteria and their rôle in butter-making); Prof. A. D. Orla-Jensen (activators for the growth of lactic acid bacteria); and Mr. F. C. Minett and Mr. E. J. Pullinger (disease-producing organisms in milk). Sir John Russell, F.R.S., director of the Rothamsted Experimental Station, will be the chairman of the second session which meets at 10 A.M. on Friday, the 24th. Papers will be read by Prof. J. R. Katz, of Amsterdam (the gelatinisation and retrogradation of starch); Mr. Holger Jorgensen (the Danish Home-grown Wheat Committee); Prof. Max Samec, of Ljubljana (some technically important properties of starch in connexion with its constitution); Mr. H. G. Bungenberg de Jong, of Utrecht (gluten formation); and Mr. C. W. Brabender, of Duisburg (fundamentals of the determination of quality of wheat flours by mechanical means). The third session will be held at 2.30 P.M., when the chairman will be Prof. H. E. Armstrong, F.R.S., and papers will be read by Prof. J. C. Drummond, and by Prof. G. S. Wilson and Mr. M. P. Cowell, dealing with the comparative nutritive values of raw and pasteurised milk. Other communications will be made by Mr. J. Vargas Eyre (the value of yeast in bread); Mr. D. W. Kent Jones (bleaching and improving of flour); and Mr. William Jago (the nutritive value of bread). A dinner will be held in the evening at 7.15 for 7.30 at the Trocadero Restaurant, Shaftesbury-avenue, W., when Mr. Geoffrey Shakespeare, Parliamentary Secretary to the Ministry of Health, will be chief guest. Further particulars may be had from the hon. secretary, food symposium, Society of Chemical Industry, 46, Finsbury-square, London E.C. 2.

Manchester Medical Ball

The annual Manchester medical ball will be held in the Midland Hotel, Manchester, on Feb. 22nd. The hon. secretary, Mr. B. W. Spurgin, may be addressed at the Medical School, Manchester.

King's College Hospital

At the recent festival dinner the Earl of Athlone, in proposing the toast of the Hospital Medical School, said that whereas in 1913 there were only 54 students in the school, there are now 349. There still remains a debt of £10,000 on the new school buildings, and Lord Athlone added that the needs of medical education, combined with the requirements of medical treatment, render imperative the completion of the hospital in accordance with the original plan of providing 600 beds.

Royal Free Hospital Post-graduate Course

A week-end post-graduate course for former students of the London School of Medicine for Women will be held at the Royal Free Hospital from Dec. 8th to 10th. On Friday the lecturers will be Mr. J. D. McLaggan and Mr. W. G. Scott Brown (ear, nose, and throat lecture-demonstration), Miss Gertrude Dearnley (a gynæcological subject), Dr. Hazel Chodak Gregory (children's diseases), and Mr. C. A. Joll and Dr. Lucy Wills (recent work on thyroid cases with basal metabolic rate estimations). On Saturday they will be Mr. P. J. Verrall (an orthopædic lecture-demonstration), Dame Louise McIlroy (modern antenatal methods), Dr. Jenner Hoskin (heart cases), and Dr. Dorothy Hare (modern methods of investigation of indigestion). On Saturday members of the course are invited to tea in the new pathology unit, and afterwards Prof. R. A. Webb will lecture on supravital counts in clinical medicine. On Sunday morning there will be four lecture-demonstrations by Mr. L. E. C. Norbury (colostomy), Mr. C. E. Shattock (a surgical subject), Miss E. C. Lewis (a urological subject), and Miss G. M. Barry (a surgical subject). Applications to join the course should reach the warden and secretary of the medical school not later than Dec. 2nd.

British Empire Cancer Campaign

In the absence of Lord Reading, Sir Holburt Waring, P.R.C.S., presided at the quarterly meeting of the grand council held in London on Monday. A letter was read from the Duke of York, the president, commending the efforts being made to organise a financial appeal on Empire Day for the purpose of securing adequate funds for the campaign. Prof. E. Mellanby, F.R.S., who has succeeded the late Sir Walter Fletcher as secretary of the Medical Research Council, was elected a member of the grand council.

Prof. W. S. Lazarus-Barlow was elected to fill the remaining vacancy on the scientific advisory committee, and the appointment of Dr. R. G. Canti as hon. secretary to the scientific committees was confirmed. The newly constituted scientific advisory committee, whose members are nominated by the Royal Society, the Medical Research Council, and the Campaign, now consists of: Lord Horder (chairman), Prof. D. P. D. Wilkie (vice-chairman), Prof. J. C. Drummond, Dr. Mervyn Gordon, F.R.S., Prof. R. T. Leiper, F.R.S., Prof. J. C. G. Ledingham, F.R.S., Prof. E. L. Kennaway, Prof. J. M. Woodburn Morison, Prof. E. C. Dodds, and Prof. Lazarus-Barlow.

The following grants, totalling £14,380, were made: the Middlesex Hospital, £5400; the Cancer Hospital, £2700; St. Bartholomew's Hospital, £2250; St. Mark's Hospital, £540; the Marie Curie Hospital, £540; the radon centre at the Middlesex Hospital (through the Medical Research Council), £350; the Mount Vernon Hospital, £900; the Strangeways Research Laboratory, Cambridge, £350; the Westminster Hospital Annexe, £300; Mr. I. Hieger (at the Cancer Hospital), £550; Dr. P. R. Peacock (the Glasgow Royal Cancer Hospital), £300; and Dr. Alexander Haddow (at the University of Edinburgh), £200.

Essays on the Biological Effects and Mode of Action of Radiations upon Malignant and other Cells, for the 1933 Garton prize and medal, should reach the offices of the Campaign by Dec. 31st.

The late Dr. Richmond Leigh

The death is announced of Dr. Richmond Leigh, of Reitz, Orange Free State, who is said to have been the oldest member of the medical profession in South Africa. He died on Oct. 22, at the age of 91. Dr. Leigh qualified as M.R.C.S. from Liverpool in 1870, and was medical officer at St. George's Skin Hospital there in 1872 to 1898. During the South African War he served as a civil surgeon, and in 1903 he was appointed district surgeon of Reitz, holding this position until his retirement in 1923.

Municipal Hospitals

A new tuberculosis pavilion, which has cost £12,000, at Harts' Sanatorium, Woodford Green, was recently opened by the then Mayor of East Ham, Alderman G. H. Manser—To Moor Park, New South Shields, the borough of Tynemouth has just added a new isolation block. It is a single-storey building with eight single-bed cubicles.

Queen Alexandra's Hospital for Officers

Lord Melchett presided at the fourteenth annual reunion dinner of this hospital on Friday, Nov. 10th, at the Criterion Restaurant, when a group of former patients and members of the nursing staff met at dinner. The chairmanship was appropriate, as Lord Melchett was a patient of the hospital on two occasions and his father built, equipped, and largely maintained the hospital for nearly five years at the suggestion of Mr. Herbert Paterson, hon. surgeon-in-charge. The work of the hospital during the war received special commendation from Sir Alfred Keogh. Lord Horder, who, until seconded for other duties, was physician to the hospital, was the guest of honour at the reunion, and referred wittily to his own surgical exploits and his reminiscences of his short period of duty at Queen Alexandra's Hospital. In proposing the toast of the Princess Victoria, from whom a telegram of good wishes was received during the evening, Lord Melchett spoke with optimism of the future of the Empire. Capt. W. L. D. Gibson responded to the toast of the former patients proposed by the chairman, and Dr. C. S. Williamson proposed the health of the Matron (Miss M. C. Sinzininex, R.R.C.) and the nursing staff, to which the Matron replied. Mr. Owen Roberts proposed the health of Mr. Paterson and Mrs. Paterson, who had served as Hon. Quartermaster to the hospital. That such gatherings should still be held is evidence of the lasting camaraderie which has followed the war.

Physiological Society

A meeting of this society will be held at the National Institute for Medical Research, Hampstead, London, N.W., at 3 P.M., on Saturday, Nov. 18th. There will be demonstrations of: the reactions of the tissues to dust from tarred roads, and the acclimatisation (?) of animals to 0·3 per cent. of carbon monoxide in inspired air (J. Argyll Campbell); perfusion of a sympathetic ganglion, and chemical transmission at synapses (W. Feldberg and J. H. Gaddum); a sensitive physical test for adrenaline (J. H. Gaddum and H. Schild); a convenient form of fluid electrode, and a forceps for passing deep ligatures (L. W. Collison); parabiotic rats and ferrets (R. T. Hill); and methods of approach in hypophysectomy (A. S. Parkes). From 4.45 P.M. onwards there will be discussions on the following printed communications: human electrocardiograms (P. Rijlant); the mechanisms of the nervous discharge of adrenaline (W. Feldberg, B. Minz, and J. Tsudzimura); and the nomenclature of fibres in the autonomic system and their effects (Sir Henry Dale). The subjects of other communications will include: the chemical transmitter of effects of the vagus nerve (Sir H. Dale); the chemical transmitter at synapses in a sympathetic ganglion (W. Feldberg and J. H. Gaddum); the relations between the action of the sympathetic and parasympathetic nerves of the stomach (J. S. Harrison and B. A. McSwiney); the effects of mechanical factors in water-diuresis in man (G. W. Theobald); the assay of ovulation-producing substances (A. S. Parkes); metabolic changes following adrenalectomy (O. Cope and others); and glycolytic formation of blood lactate (C. Lovatt Evans and others). The assistant hon. secretary may be addressed at the department of physiology, University College, Gower-street, W.C.1.

Devizes and District Hospital

This institution has become so inadequate that an appeal is being made for £21,000 for its modernisation and enlargement. The building, which was erected in 1870 and enlarged in 1887 and again in 1911, has no out-patients' department, and out-patients have to be attended to in the X ray room or the general wards. Accident cases also have to be dealt with in the general wards at whatever hour they may be admitted. Fracture cases sometimes have to be sent home after treatment, and other patients, it is stated, have frequently to be discharged prematurely although the eight-bed wards have on occasions to hold 10, 12, or even more patients. The sleeping accommodation for nurses and maids is so restricted that some have to sleep out, and some of those accommodated in the hospital have to share bedrooms with one, two, or even three, others. Night nurses have to write their notes in a passage. There is no isolation block, and it is impossible to improve the kitchen and other domestic accommodation. Ground immediately adjacent is now available, and it is proposed first to build new nurses' and kitchen quarters, and an out-patients' and accident department.

Medical Diary

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Nov. 21st.—5.30 P.M., GENERAL MEETING OF FELLOWS. Ballot for election to the Fellowship. 8 P.M., PATHOLOGY. Laboratory Meeting at University College Hospital, Gower-street, W.C. Meetings are open to contributors other than those working in the Laboratory where the meeting takes place. Those wishing to read papers should apply to the Hon. Secretary in the usual way.

WEDNESDAY.—5 P.M., COMPARATIVE MEDICINE. Discussion: Louping-ill. Openers: Mr. W. S. Gordon, Mr. W. A. Pool, and Mr. I. A. Galloway. Other speakers will take part.

THURSDAY.—8.30 P.M., UROLOGY. Clinico-Pathological Meeting. Cases and specimens: Mr. A. Clifford Morson: (1) Drawing of a Hermaphrodite. Mr. Cuthbert Dukes: (2) Tuberculosis of Kidney. Mr. Alex. E. Roche: (3) Silent Renal Tuberculosis; (4) Atypical pyelograms of Polycystic Kidney. Dr. H. W. Parrott: Hydronephrotic Atrophy of Kidney following Amputation of Hip. Mr. E. W. Riches: (6) Pyelograms of Ureteral Obstruction due to Extramural Causes; (7) Case of Hypogonadism.

FRIDAY.—5 P.M., DISEASE IN CHILDREN. Cases and Specimens: Dr. Bernard Schlesinger: (1–2) Chronic Pyuria treated with Autogenous Vaccines. Dr. Hugh Lankester (by permission of Dr. W. T. Gordon Pugh): (3) Bilateral Tuberculous Epididymitis with Hydronephrosis. Dr. Norman B. Capon: (4) Renal Rickets with Calcification in the Kidneys. Dr. Stanley Rodgers: (5) Pyelonephritis with usual Failure-recovery. Dr. M. Bolton (for Dr. C. Alice King): (6) Precocious Puberty in a child of three. Dr. Donald Bateman (for Dr. Donald Paterson): (7) Renal Sarcoma of Infancy. Dr. Stanley Rodgers: (8) Congenital Heart-block. Dr. T. Skene Keith and Dr. S. A. Owen: (9) Double Ureterocele with Dilated Ureters and Early Hydronephrosis. Mr. O. L. Addison: (10) Lantern Slides of some Renal Abnormalities. Dr. W. T. Gordon Pugh: (11) Lantern Slides of Renal Calculi in Cases of Prolonged Recumbency. Other cases illustrating diseases and abnormalities of the urino-genital tract will be shown in addition to cases of general interest. Members of the Section of Urology are specially invited to attend the meeting and to show cases. 8 P.M., EPIDEMIOLOGY AND STATE MEDICINE. Dr. J. D. Rolleston: The Small-pox Pandemic of 1870–74. (Presidential address.) Members of the History of Medicine Section are specially invited to attend the meeting.

HUNTERIAN SOCIETY.

MONDAY, Nov. 20th.—9 P.M. (at the Cutler's Hall, Warwick-lane, E.C.), a discussion on That Alcohol is of Value to the Citizen. Opened by Mr. P. J. Hannon, M.P., Dr. W. J. O'Donovan, M.P., Dr. J. D. Rolleston, and Mr. J. Hugh Edwards, J.P.

CHELSEA CLINICAL SOCIETY.

TUESDAY, Nov. 21st.—8.30 P.M. (at the Hotel Rembrandt, Thurloe-place, S.W.), Mr. Zachary Cope: The Simulation of Acute Abdominal Disease; preceded, at 7.15 P.M., by a dinner.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, St. John's Hospital, 49, Leicester-square, W.C.

WEDNESDAY, Nov. 22nd.—4.15 P.M., Dr. J. E. M. Wigley: Multiple Cystic Endotheliomata of the Skin.

NORTH-WEST LONDON MEDICAL SOCIETY.

TUESDAY, Nov. 21st.—9 P.M. (in the Regal Rooms, adjoining Café, Finchley-road, nr. Golders Green, N.W.), Dr. R. D. Lawrence: Simple Facts in the Treatment of Diabetes.

MEDICO-LEGAL SOCIETY, 11, Chandos-street, Cavendish-square, W.
THURSDAY, Nov. 23rd.—8.30 P.M., Sir John Collie: Workmen's Compensation—its Medical Aspect.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Upper Montague-street, Russell-square, W.C.
FRIDAY, Nov. 24th.—5 P.M., Discussion on Responsibility of the Local Authority Towards the Blind. To be opened by Dr. E. K. Macdonald, M.O.H., Stockport.

CHILD STUDY SOCIETY, 29, Tavistock-square, W.C.
THURSDAY, Nov. 23rd.—6 P.M., Dr. Margaret F. Lowenfeld: Freedom and Discipline in Education.

HACKNEY MEDICAL SOCIETY.
WEDNESDAY, Nov. 22nd.—9.30 P.M. (at the Royal Veterinary College, N.W.), Sir Frederick Hobday: Diseases Analogous in Animals and Man and their Comparative Aspect.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Nov. 20th, to SATURDAY, Nov. 25th.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Evening M.R.C.P. Course. Tues. and Thurs. at 8 P.M.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Course in Medicine, Surgery, and Gynæcology. All day.—LONDON LOCK HOSPITAL, Dean-street, W. Course in Venereal Disease. Afternoons and evenings.—ST. MARK'S HOSPITAL, City-road, E.C. Course in Proctology. All day.—BRITISH RED CROSS CLINIC, Peto-place, N.W. Course in Rheumatism. Tues. and Thurs. at 8 P.M.—PANEL OF TEACHERS. Individual clinics are available daily by arrangement with the Fellowship of Medicine. Courses, &c., arranged by the Fellowship of Medicine are open only to Members and Associates.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith-road, W.
MONDAY, Nov. 20th.—10 A.M., Medical Wards, Skin and Genito-urinary Clinics. 11 A.M., Surgical Wards. 2 P.M., Medical, Surgical, Eye and Gynæcological Clinics. Gynæcological Wards. 4.15 P.M., Lecture, Dr. Burnford: Febrile States.
TUESDAY.—10 A.M., Medical Wards. 11 A.M., Surgical Wards. 2 P.M., Medical, Surgical, and Throat Clinics. 4.15 P.M., Lecture, Mr. Green-Armytage: Contraception.
WEDNESDAY.—10 A.M., Medical and Children's Wards. Children's Clinic. 2 P.M., Medical, Surgical, and Eye Clinics. 3.45 P.M., Venereal Diseases.
THURSDAY.—10 A.M., Neurological and Gynæcological Clinics. 11.30 A.M., Fracture Demonstration. 2 P.M., Medical, Surgical, Eye, and Genito-urinary Clinics. 4.15 P.M., Lecture, Dr. Burnford: Febrile States.
FRIDAY.—10 A.M., Skin Clinic. 12 noon, Lecture on Treatment. 2 P.M., Medical, Surgical, and Throat Clinics. 4.15 P.M., Lecture, Dr. Konstam: Syphilis of the Heart.
SATURDAY.—10 A.M., Medical and Surgical Wards, Children's and Surgical Clinics. The lectures at 4.15 P.M. are open to all medical practitioners without fee.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
TUESDAY, Nov. 21st.—11.30 A.M., Pathological and Biochemical Demonstration.
WEDNESDAY.—9.30 A.M., Skin Clinic. 2 P.M., Dental Clinic.
THURSDAY.—2 P.M., Tonsils, Adenoids, and Anæsthesia.
SATURDAY.—9.30 A.M., Eye Clinic.
Medical and Surgical Out-patient Clinics: daily from Monday to Saturday, 10 A.M. to 12 noon. Medical Wards: mornings, 10 A.M., Monday, Wednesday, Thursday, and Saturday; afternoons, 2 P.M., Monday, Tuesday, Thursday, and Friday. Surgical Wards: Tuesday, Thursday, Friday mornings, and Wednesday afternoon.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Nov. 20th.—3.30 P.M., Dr. Kinnier Wilson: Disorders of Cerebral Function, Aphasia, Apraxia, &c.
TUESDAY.—Dr. Denny-Brown: Conditioned Reflexes.
WEDNESDAY.—Dr. Collier: Clinical Demonstration.
THURSDAY.—Dr. Walshe: The Motor System.
FRIDAY.—Dr. Carmichael: The Vegetative Nervous System. Out-patient Clinic each day at 2 P.M.

HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.
THURSDAY, Nov. 23rd.—3 P.M., Dr. F. L. Golla will demonstrate.

ST. PAUL'S HOSPITAL, Endell-street, W.C.
WEDNESDAY, Nov. 22nd.—4.30 P.M., Mr. Kenneth Walker: Treatment of Bladder Growth. Illustrated by Cinema.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James Hospital, Ouseley-road, Balham, S.W.
WEDNESDAY, Nov. 22nd.—4 P.M., Mr. J. P. Lockhart-Mummery: Incontinent Anus.

ROYAL INSTITUTE OF PUBLIC HEALTH, 23, Queen-square, W.C.
WEDNESDAY, Nov. 22nd.—4 P.M., Rev. J. C. Pringle (Secretary, C.O.S.): Citizenship and Charity.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY, Nov. 23rd.—9 P.M., Mr. A. C. Palmer: Prolapse and the Prolapse Syndrome. (Dr. C. B. Heald's lecture has been postponed.)

CHARING CROSS HOSPITAL MEDICAL SCHOOL, Chandos-street, W.C.
SUNDAY, Nov. 19th.—10.30 A.M., Dr. F. H. Young: Asthma. 11.45 P.M., Mr. A. O. Gray: Prenatal Care.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Nov. 24th.—4 P.M., Mr. W. A. Mill: Earache in the Normal Ear.

THE LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Nov. 21st.—5 P.M., Dr. H. W. Barber: Immunity and Anaphylaxis.
THURSDAY.—5 P.M., Dr. W. N. Goldsmith: Pigmentation of the Skin.

NATIONAL COUNCIL FOR MENTAL HYGIENE.
WEDNESDAY, Nov. 22nd.—24th Mental Health Conference at the Caxton Hall, Westminster, S.W.
SATURDAY.—10.30 A.M., Special Session for Medical Magistrates.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL Post-graduate Lectures.
WEDNESDAY, Nov. 22nd.—4 P.M., Mr. A. J. Gardham: Results of Radium Treatment of Growths of the Mouth and Pharynx.

CHADWICK PUBLIC LECTURES.
TUESDAY, Nov. 21st.—8 P.M. (at the London School of Hygiene, Keppel-street, W.C.), Dr. Charles Porter: "Bossom Gift." Symposium. The One-pipe System of House Drainage in Theory and Practice.

LEEDS GENERAL INFIRMARY.
TUESDAY, Nov. 21st.—4 P.M., Mr. R. Broomhead: Manipulation of Joints.

MANCHESTER ROYAL INFIRMARY.
TUESDAY, Nov. 21st.—4.15 P.M., Mr. J. P. Buckley: Some Aspects in the Treatment of Hernia.
FRIDAY.—4.15 P.M., Dr. F. E. Tylecote: Demonstration of Medical Cases.

ANCOATS HOSPITAL, Manchester.
THURSDAY, Nov. 23rd.—4.15 P.M., Dr. R. Ellis: Rheumatoid Arthritis.

MANCHESTER HOSPITAL FOR CONSUMPTION AND DISEASES OF THE THROAT AND CHEST, Hardman-street, Deansgate, Manchester.
WEDNESDAY, Nov. 22nd.—4.30 P.M., Dr. Simon Kelly: Differential Diagnosis of Pulmonary Tuberculosis.

GLASGOW Post-graduate Lectures.
TUESDAY, Nov. 21st.—3.30 P.M. (in the Faculty Hall, Vincent-street), Dr. S. J. Cameron: Recent Views on the Toxæmias of Pregnancy.
WEDNESDAY.—4.15 P.M. (at the Royal Maternity and Women's Hospital), Prof. J. M. Munro Kerr: Obstetrical Cases.

Appointments

BLACK, GEO. W., M.B., B.S. Lond., F.R.C.S. Eng., has been appointed Hon. Ophthalmic Surgeon to the General Infirmary, Leeds.

VENTERS, MARGARET, M.B., Ch.B. Edin., Resident Medical Officer, Isolation Hospital of Queen Charlotte's Maternity Hospital, Ravenscourt-square, Hammersmith.

Certifying Surgeons under the Factory and Workshop Acts: FERRIE, A. MCLAREN, M.B., Ch.B. Edin. (St. Helens); WRIGHT, A., M.B., Ch.B. Edin. (Portobello).

Births, Marriages, and Deaths

BIRTHS

GWYNNE-EVANS.—On Oct. 28th, at Ealing, the wife of Dr. E. Gwynne-Evans, of a daughter.

MONTGOMERY.—On Nov. 11th, the wife of Dr. G. O. Montgomery, of South Park Hill-road, Croydon, of a son.

PANK.—On Nov. 3rd, at Gallwey House, Thornhill, Aldershot, the wife of Major P. E. D. Pank, R.A.M.C., of a son.

SAINT.—On Oct. 31st, the wife of James H. Saint, M.D., F.R.C.S., of Newcastle-upon-Tyne, of a son.

MARRIAGES

BENNETT—ROWLES.—On Oct. 31st, at St. Botolph's Church, Chevening, Kent, Randle Bennett, M.R.C.S., L.R.C.P., to Dorothy Margaret, only daughter of the late F. L. Rowles and of Mrs. Rowles, of Riverhead, Sevenoaks.

BLOXSOME—BAULD.—On Oct. 28th, at Cheltenham, Harold Bloxsome, M.R.C.S., L.R.C.P., of Fairford, Glos., to Helen, second daughter of Mr. and Mrs. W. Bauld, of Glencraig, Fife, and Dundee.

DEATHS

PULLAR.—On Nov. 1st, at Upper Richmond-road, Richmond, Alfred Pullar, M.D., aged 88.

STEEDMAN.—On Nov. 3rd, suddenly, at Stonehouse, Gloucester, Dr. Daniel Mackenzie Steedman, aged 85.

SUTHERLAND.—On Nov. 6th, at Wellgate House, Newport, Fife, after a very short illness, Lewis Robertson Sutherland, M.B., C.M., Emeritus Professor of Pathology of St. Andrews University College, Dundee.

YOUNG.—On Oct. 30th, suddenly, at Park-circus, Ayr, Alfred Alexander Young, M.B., Hon. Sheriff Substitute of Ayr.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

A MODEL PUBLIC MORTUARY

WELL-FOUNDED complaints have recently been made by pathologists in various parts of the country of the bad accommodation provided for the conduct of post-mortem examinations ordered by the coroner. Often no satisfactory post-mortem room is provided, or if provided, it is not fitted with an adequate supply of running water, is not properly lighted, heated, or ventilated, and the arrangements for storing the subjects are quite inadequate. It would serve no good purpose to detail the unpleasant conditions under which pathologists are expected to work by some local authorities, but it may be useful to show how greatly not only their convenience but the public welfare is served by the introduction of modern equipment into properly planned buildings. In the London district Battersea Public Mortuary is regarded as a model of its kind and it will be clear from the details set out below that it is especially well adapted to its purpose.

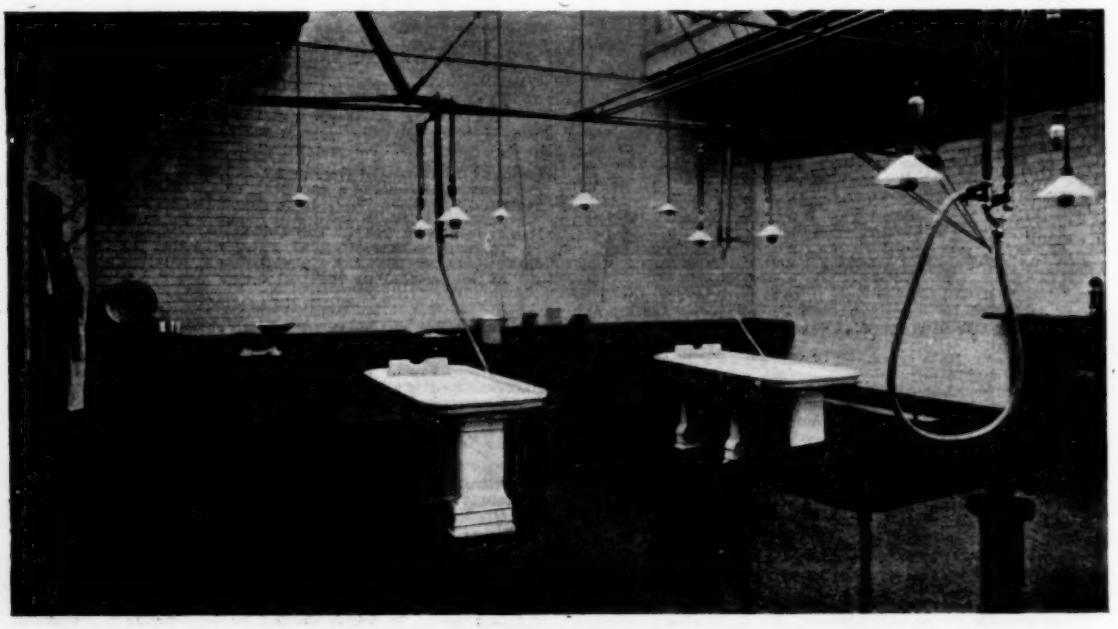
Battersea Public Mortuary was erected by the borough council in 1901. The buildings, which are conveniently situated around a courtyard, consist of a preparing room, post-mortem room, store room, and mortuaries. Except in the store room, where the walls are distempered and the floor is of concrete trowelled to an impervious surface, the walls are finished with opal glass tiles with angle pieces reaching from the sloping ceilings to the floor coving, and terrazzo floors are provided.

The *post-mortem room* measures 30 ft. by 24 ft., is extremely well lighted by day from the roof and by windows; artificial lighting is supplied in the form of 13 daylight blue electric lamps, so that the colour of the material under examination is well-defined. On the north side is a steam-heated tubed radiator extending the whole length of the room. Along one wall is a long marble bench to hold scales and instruments, and a sink of good design. The room contains three pedestal post-mortem tables, two of which are of white glazed earthenware, bevelled to two draining points, one on each side (instead of a central one which may be blocked by the body); 1½ in. non-corrosive metal waste pipes discharge into a white glazed channel covered with a suitable grating which empties into a gully outside. The third table is of slate and is to be replaced shortly by a table similar to the others but 3 ft. 2 in. instead of 2 ft. 9 in. in height. There is a hot and cold water service to the sink and to each table with an overhead mixing valve. The hot water is supplied by a 30-gallon thermostatic gas storage heater. A telephone extension is fitted to the post-mortem room and a dressing room with lavatory accommodation is available for the pathologist.

The mortuaries.—The larger of these measures 25 ft. by 19 ft., with top lighting, the side lights being fitted with glass louvres. The refrigerating plant, recently installed by Frigidaire, Ltd., extends the full width of the room and has accommodation for 18 bodies. The viewing room is placed between the two mortuaries, with plate glass partitions on each side in the walls separating it from the mortuaries. The viewing room also contains a glass-fronted cabinet used for the purpose of identification of clothing.

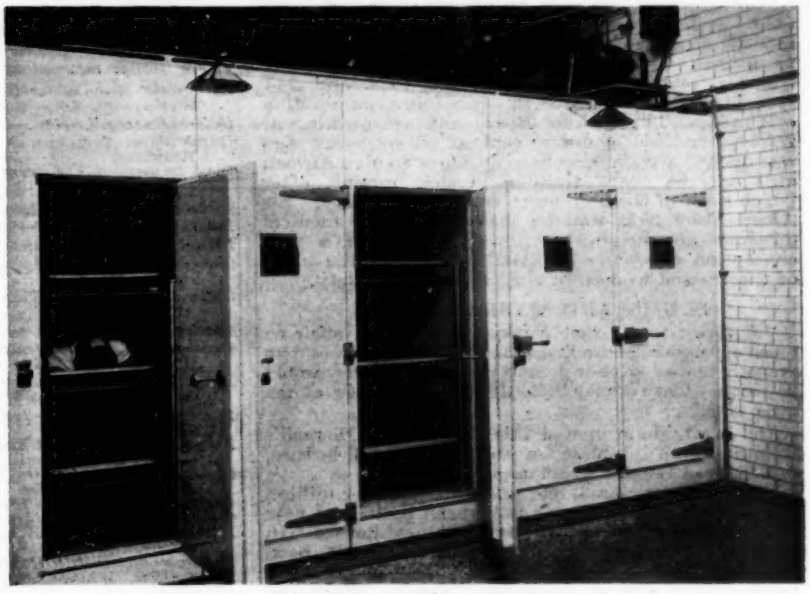
The smaller mortuary is 18 ft. long by 12 ft. wide. On the south side facing the viewing room are eight catacombs which are at present used for the storage of zinc-lined shells.

The *refrigerator* has two compartments, the larger holding 12 bodies in tiers of 3 and the smaller 6 bodies, the temperature being maintained automatically at 34° and 20° F., respectively. The compartments can be cooled separately or together, since the controls are separate. No skilled operator is needed to work the plant. A special device is fitted to enable the coils within the refrigerator to be defrosted without appreciable loss of temperature. The running costs are estimated to average 6*d.* per day. It will be noticed from the illustration that the plant occupies the minimum of floor space and that the compressor unit and controls are on the roof of the cabinet; this reduces the risk of possible interference. The body racks and trays, supplied by Messrs. James Gibbons, Ltd., are made of steel, the trays being finished in stove-enamelled aluminium with a coat of cellulose clear lacquer from which blood stains are easily removed. On the underside of the trays, skids or runners are fixed which engage with the grooves provided in the ball-bearing rollers and enable a loaded tray to be drawn out with ease; the rollers are easily removable as are certain cross members of the



The Post-mortem Room.

racks, thus affording easy access to the interior. (These racks are made to conform with any make of refrigerating chamber; they have been supplied to the City of Westminster mortuary where the refrigeration is executed by Messrs. Kelvinator, Ltd.) The granolithic floor has a suitable covering and there is a trapped drain in each compartment into which the waste from the drip trays also discharges when defrosting is going on.



The Refrigerator (Frigidaire type).

ADVANTAGES OF REFRIGERATION

The advantages of an adequate refrigeration plant need hardly be emphasised. In its absence bodies deposited for post-mortem examination are often placed on tables in the post-mortem room some time before the examination takes place. During the summer months putrefaction may advance rapidly during this period, and the presence of the blow-fly in large numbers is only the most obvious of many unpleasant conditions that may arise. It is often necessary, moreover, for bodies to be kept for several days before the inquest is held and in the absence of refrigeration the relatives are compelled to go through the ordeal of identifying a decomposed body. Where bodies can be placed in the refrigerator until the time of the post-mortem examination, and again when this is completed, they can be removed from the mortuary in the same state of preservation as when deposited.

In the event of a delayed burial, the body is placed in a temperature of 34° F. until the post-mortem examination is done, after which it can be kept in a still colder compartment, at a temperature of 20° F., for an indefinite period without the development of further putrefactive changes. This is obviously an important consideration in medico-legal work and for identification purposes.

VENTILATION

The only aspect of this mortuary which is not as yet completely satisfactory is its ventilation. Whilst the post-mortem room is excellently lighted by lantern light fitted with opening sashes, these do not provide sufficient ventilation to prevent the room from becoming uncomfortably hot and stuffy during the summer months. Proposals are under consideration for the installation of mechanical means of improving the ventilation, and it is anticipated that these additions will be provided early in the new year.

The Battersea borough council deserve congratulation on the efforts they are making to introduce the most modern equipment in their public mortuary and to arrange for its orderly and seemly maintenance.

THE CENTRAL OPIUM BOARD

THE report to the Council of the League of Nations of the Permanent Central Opium Board, to which reference was made in our issue of Oct. 7th (p. 818), is now obtainable from the League's Publication Department (40, Museum-street, London, W.C.1.), price 4*s*. It includes, besides the annual report of the Board for the year 1932, statistical returns and graphs showing the distribution of raw opium, morphine, heroin, and cocaine in various countries supplied in virtue of the Opium Convention of 1925. The imports, exports, stocks, manufacture, conversion, and consumption of the same drugs in manufacturing countries are dealt with, as also are the seizures of illicit commerce effected in the year 1932. While some countries, parties to the Opium Conventions, have failed to furnish returns, it appears that a total manufacture of 25,319 kg. morphine was recorded in 1932. Of this amount 1070 kg. were used in the manufacture of heroin, while 16,866 kg. were utilised for preparing substances which are not at present covered by the terms of the Convention of 1925. The total production of cocaine returned in 1932 amounted to 3973 kg., rather less than in each of the three previous years; whereas more of this alkaloid was manufactured last year in Great Britain, Netherlands, and Switzerland, the production in Germany, the United States, France, and Japan was less than in 1931.

The report which, with annexes, runs to 122 pages, is well worthy of study by those who desire to learn the efforts which have been, and are being, made through the League of Nations to restrict the use of dangerous narcotic drugs to the requirements of medicine and science.

THE NEW OBJECTIVE OF MEDICAL MISSIONS

IN an attractive booklet of 88 pages entitled "Hospitals Overseas," just issued by the Church Missionary Society (Salisbury-square, London, E.C.4), a list is given of 68 hospitals for which the C.M.S. is responsible in different parts of Africa and Asia. The first aim of the medical mission, Dr. Fletcher Moorshead says, is to set an object lesson of how a community should care for its sick and needy folk, and the missionary's first thought is how to relieve the physical need which stares him in the face in the contacts of daily life. But in a chapter entitled "Building for the Future," Sir Albert Cook suggests that the Mengo hospital in Uganda has now reached the acme of its prosperity as a missionary institution, and he asks whether by any conceivable stretch of imagination English doctors and nurses alone can do more than touch the fringe of physical need in a population of three million people, or teach more than a tiny fragment of them the great lessons of preventive medicine. Henceforward, he says, the aim must be to train native Africans to help their own countrymen; and in 1917 a medical school was opened by the C.M.S. in the protectorate, but this was taken over in 1924 by the Government, which now trains candidates up to the Indian sub-assistant surgeon standard. The mission then started to train the

better educated Baganda women in maternity and child welfare work, for the deaths under twelve months of age in the protectorate amounted in 1920 to a rate of 330 per thousand live births. The training school was completed in 1921, and 111 students have now passed the qualifying examination of the Uganda Midwives Board and are working at thirty scattered country centres. Two years ago was opened a training college designed to give African girls a three years' training in sick nursing, after which most of them go on to train in maternity. Sir Albert Cook feels that in these efforts the medical missions are helping to develop overseas a new conception of women's capabilities and of the place of the trained woman in the progress of society.

SLUMS AND GARDEN CITIES

"It seems to me that pauperism is not an affair so much of wages as of dwellings. If the working classes were properly housed at their present rate of wages they would be richer. They would be healthier and happier at the same cost."

Dr. R. O. Moon quoted this saying from Disraeli's "Lothair" in his Malcolm Morris memorial lecture, delivered in London last Tuesday.

Since 1919, he said, one and three-quarter million houses of the smaller type have been built, and now nearly 8,000,000 people are living in new houses. In spite of this, however, the slums have not been emptied; in fact not more than 75,000 people have been cleared out of insanitary slums. They are said to be as full as ever and in worse condition than in 1914. The evils of these slums have arisen largely because modern towns have developed without any plan; there was no reason for this great congestion of the modern town, with factories crowded together and factory workers huddled into miserable and squalid dwellings.

Town-planning Dr. Moon defined as the art and science of arranging beforehand for the extension of towns and the protection of the country. "It aims at preventing ugliness and preserving beauty; it aims at preventing disease and therefore promoting health. It is, one might say, the application to social conditions of the principles of preventive medicine." But even the town-planning measures now available will not, in Dr. Moon's opinion, be sufficient in themselves to prevent the recurrence of slums. The best remedy is to remove some of the inhabitants of over-populated towns and build towns de novo to receive them. Such a new town should be surrounded by an agricultural belt which can never be built upon, and must not only develop its own life, engender its own culture, nurture its own tradition, but also be a small self-contained town, provided with all the facilities for fuller life that modern civilisation has secured for us. This idea is the origin of the garden city, of which there are now two—Letchworth and Welwyn.

It would not be unnatural, Dr. Moon said, to conclude that in garden cities the diminution of overcrowding, the limiting of the number of houses per acre, the greater amount of open spaces, and the fact that the workers, after the day's work is done, are able to stroll into the country, would tend to the general improvement of health; and, as a matter of actual experience, Letchworth, with a population of about 15,000 had, in the year 1930, when the death-rate for England and Wales was 11·4, a rate of 6·7. Whereas the infant mortality per 1000 births in England and Wales was 60, for Letchworth it was only 20. In Welwyn, which has a population of not more than 7000, the death-rate is as low as 5·66 and the infant mortality-rate is 20·19.

MEDICAL JOURNAL AND RECORD.—This old-established journal has changed hands recently. Dr. Gregory Stragnel, who has been its editor for many years, becomes proprietor, and the journal is now published from 110, Washington-street, New York City. The paper was amalgamated with the *New York Medical Journal* some 20 years ago.

Vacancies

For further information refer to the advertisement columns

All Saints' Hospital for Genito-Urinary Diseases, Austral-street, West-square, S.E.—Res. H.S. At rate of £100–£150.

Bedford County Hospital.—Second H.S. At rate of £140.

Belfast Joint Nursing and Midwives' Council.—Examiners for Midwives.

Belgrave Hospital for Children, Clapham-road, S.W.—Asst. Physician. 50 gns.

Birmingham Children's Hospital.—Cas. O. £350.

Bolton Royal Infirmary.—Three H.S.'s. Each £125.

Bristol University.—Chair of Anatomy.

Chelmsford Borough.—Specialist Consultant. 3 gns. per consultation.

Chelsea Hospital for Women, Arthur-street, S.W.—Jun. H.S. At rate of £100.

Chester Royal Infirmary.—H.P. £150.

Dewsbury and District General Hospital.—Sen. H.S., and Second H.S. £200 and £150 respectively.

Elizabeth Garrett Anderson Hospital, Euston-road.—H.P., Obstetric Asst., and Three H.S.'s. Each at rate of £50.

Essex County Council.—Asst. County M.O. and Deputy M.O.H. £700.

Exeter Royal Devon and Exeter Hospital.—Hon. M.O. to Radiological and Electrical Dept.

Gloucester, Gloucestershire Royal Infirmary, &c.—Two H.S.'s. Each at rate of £150.

Great Yarmouth General Hospital.—H.S. £140.

Guildford, &c., Rural Districts.—M.O.H. £800.

Hampstead Metropolitan Borough, N.W.—Two Cons. Obstetricians.

Haslemere and District Hospital.—Res. M.O. At rate of £150.

Home Office, Whitehall, S.W.—Med. Inspector of Factories. £726.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Hon. Psychiatrist. Also Two Med. Regs. Each £100.

Hove General Hospital.—Two District M.O.'s.

Hull Royal Infirmary.—Cas. O. and Third H.S. Each at rate of £150.

Ilford, King Geoge Hospital.—Res. M.O. £250.

King Edward VII. Sanatorium, Midhurst.—First Asst. M.O. £450.

Kingston-upon-Thames, County Sanatorium, Milford.—Third Asst. M.O. At rate of £250.

Lambeth Hospital, Brook-street, Kennington.—Res. Med. Supt. £1400.

Liverpool, Smithdown-road Hospital.—Res. Asst. M.O. £200.

Liverpool, Women's Hospital, Catherine-street.—H.S. At rate of £100.

London County Council.—Temporary District M.O. £200. Also Two Divisional M.O.'s. Each £800.

Manchester, Ancoats Hospital.—Res. M.O. £200. Surg. Registrars.

Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Jun. Res. M.O. At rate of £50.

Miller General Hospital, Greenwich-road, S.E.—Cas. O. and Out-patient Officer. Each at rate of £150. Also H.S. and H.P. Each at rate of £100.

Newcastle-upon-Tyne, City Hospital for Infectious Diseases.—Res. Med. Asst. £350.

Northampton General Hospital.—H.S. and Cas. O. At rate of £150 and £120 respectively.

Oldham Royal Infirmary.—H.S. At rate of £175.

Poole, Dorset, Cornelia and East Dorset Hospital.—Hon. Asst. Anæsthetist.

Princess Beatrice Hospital, Richmond-road, S.W.—Res. M.O. At rate of £110.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Third M.O. for Antenatal Dept.

Queen Mary's Hospital for the East End, E.—Hon. Asst. Radiologist. Also Dental Anæsthetist. £25. Also Res. M.O. £200. And Cas. O. At rate of £150. Also H.S.'s, and H.P.'s., &c. Each at rate of £120.

Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100.

Reading, Royal Berkshire Hospital.—Res. Anæsthetist. £150.

Royal Free Hospital, &c., Gray's Inn-road, W.C.—Bacteriologist and Lecturer in Bacteriology. £500. Also Surg. Reg. £200. Also Gynæcological Reg. and Med. Reg. Each £100. Also H.P.'s, H.S.'s, &c.

Royal National Ophthalmic Hospital, 234, Gt. Portland-street, W. Hon. Gynæcologist.

Royal Society of London, Burlington House, W.—Foulerton Research Studentship. £700.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E. H.S. At rate of £100.

St. George's Hospital, S.W.—Psychiatrist. Also Asst. Phys. to Skin Dept.

St. Mary's Hospital, W.—Cas. H.S. At rate of £100.

Salford, Infectious Diseases Hospital.—Jun. Asst. Res. M.O. £200.

South London Hospital for Women, Clapham Common, S.W.—H.P., and H.S. Each at rate of £100.

Stoke-on-Trent, Longton Hospital.—H.S. £160.

Surrey County Council.—Two Asst. M.O.'s. Each £600.

Wells Mental Hospital, Somerset.—Asst. M.O. £350.

West London Hospital, Hammersmith-road, W.—H.P. and Two H.S.'s. Each at rate of £100.

Willesden Municipal (Fever) Hospital, Brentfield-road, N.W.—Res. M.O. £250.

Windsor, King Edward VII. Hospital.—Two H.S.'s. Each at rate of £100.